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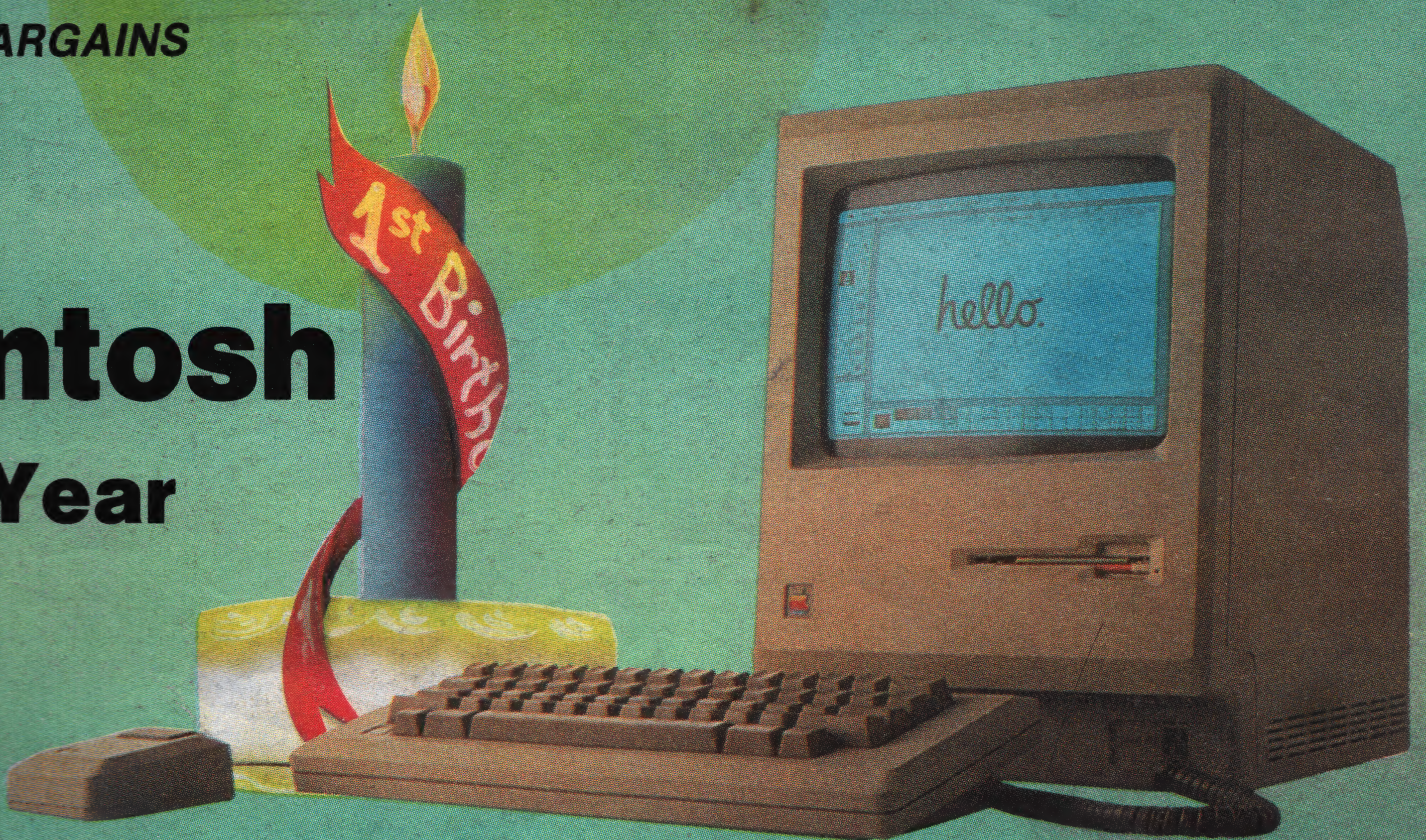

Macintosh

After 1 Year

In This Issue

- Macintosh — An Evaluation
- Sinclair Returns — Interview With Nigel Searle
- Introducing The Sinclair QL
- Connecting Your Printer To Apple IIc
- MacVision — A Digitizer
- New Media Master Program

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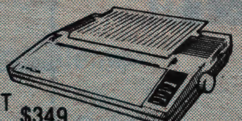

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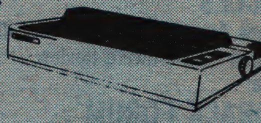

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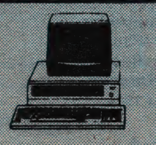

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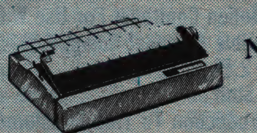

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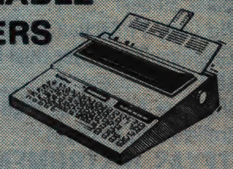

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The First Anniversary Of The Macintosh

A short review of its history and some speculation about its future.

by Peter Schug

The Macintosh is a year old!!! 1984 is a memory. We survived, after a fashion, and so has Apple and the Macintosh. For a brand new, radically different computer, it did very well.

The Macintosh had its origins in the work of Alan Kay about ten years ago. Kay was running a research project at Xerox PARC, working on something he called the Dynabook. After the project was well underway Jef Raskin dragged a reluctant Steve Jobs over to see what Kay had done and Jobs saw the future. The Dynabook (which was supposed to be notebook sized) was implemented on a mini, with a desk sized hard disk. It had the now familiar overlapping windows, icons, black text in a variety of fonts on a white background, impressive graphics and the mouse controller. Kay's concept was that the images on the screen would look and behave like objects in the real world and the mouse was your handle on those images completing the real world illusion.

Xerox seems to have done little with the things that Kay produced. They did come out with the Star, which was priced out of the price range of the consumer market. They ignored Smalltalk, the language that Kay's group designed for the Dynabook (Apple reportedly has licensed Smalltalk from Xerox) and they let Kay and most of his team slip out of their fingers. At least two other machines have a similar user interface. Niklaus Wirth's "Lilith" is reputed to use overlapping windows and a mouse. (Interestingly enough Professor Wirth spent a sabbatical year at Xerox.) Tektronics also sells a machine that has a bit-mapped, windowing, mouse controlled screen and uses Smalltalk, licensed from Xerox. Once again, these machines are rather too expensive for personal use.

Jef Raskin initiated the Macintosh project, (including the spelling of Macintosh) and Apple hired some of the Dynabook creators to work on the Mac. Alan Kay joined Apple after the Mac was designed so his direct personal input didn't affect the machine. However, Kay's influence pervades the Mac, as it does the rest of the world of small computers, as features of the Mac are imitated in software, and eventually hardware.

When introduced, Macintosh had 128K of memory and one internal 400K disk drive. The only software available was MacWrite and MacPaint from Apple and BASIC and Multiplan from Microsoft. The BASIC was stock off-the-shelf 68000 BASIC with very little Mac'ish about it. Using BASIC after playing around with MacPaint, MacWrite and the Mac finder was like taking a trip backwards in time. Multiplan had some serious bugs causing lost files. Even though MacWrite was a pleasure to work with, it would only handle documents of about eight pages, and had few advanced features. Except for the release of Habadex (Data Base), there seemed to be lots of announcements and no software for quite a while. Gradually the announcements slowed, the release dates receeded toward some distant and hazy horizon as the developers discovered that the Mac placed extraordinary demands on their programming staffs. The normally trivial job of porting an application over to a new machine wouldn't work on the Mac. Getting software running on the Mac means integrating the application to the Mac user interface which in turn means understanding how the Mac works. That is described in an eight hundred page tome called "Inside Macintosh" which requires at least two readings since there is no coherent organization in this still unfinished product of many hands. The lure of Mac gold (estimated sales the first year are probably better than 250,000 units) has spurred software developers to meet the challenge, so the long drought is over and new software is starting to appear on a regular basis. This not only means software today, but a growing body of programmers now exists who now understand the Mac and will probably continue to write for it.

The Author Pictured by MacVision

Microsoft, probably smarting under the criticism of disgruntled early Mac users not only fixed their Multiplan and made sure everyone got updates promptly, but also wrote a fine version of BASIC for the Mac, that I am sure will set new standards on other machines as well. They took their time releasing the next couple of applications, but they disappointed no one, and "Word" has already won wide acceptance among those who need its more powerful set of features. Not only is Word more powerful than MacWrite, but all of its features can be accessed without the mouse, which is a plus for a fast typist, and an answer to the most common criticism of the mouse in a word processing environment.

Fat Mac

The "Fat Mac" upgrade arrived amid cheers and jeers. Most people considered the price the upper limit of what Apple could get away with. Actually, the dealers got a good percentage for the half hour of work the board swap took, and if they didn't make a profit, who would have installed the upgrade? Apple eased the price shock by giving away two major applications with the upgrade, and dropped the price (and the give-away) as soon as the price of 256K chips made it possible. Today the "Fat Mac" 512K version seems to be the standard, and most advertisements include a package price for the Fat Mac, Imagewriter, and the external drive. There are several hard disks available, but the most exciting disk option so far is the Hyperdrive from General Computer. It is an internally mounted 10mbyte hard disk connected directly into the system bus instead of the serial port as is the case for all Mac external hardware. Hyperdrive transfers data much faster than other drives.

Language Support

Where once BASIC was the only high level language, now there is Forth, and several C language native code compilers, the UCSD P-system is available at a rather high price and what looks like a nice and complete Modula 2 from Modula Corp. costs only $90 and comes with 540 pages of solid looking documentation. It compiles to "M" code and requires a license fee for the runtime system if you want to sell what you write, but it looks awfully nice. Too bad about the license fee. Most of the C language compile to native code run faster and require only a copyright notice to protect the library. It is impossible to talk about Mac languages and not mention Mac Pascal, the BEST learning and debugging environment for any language on any machine. Mac Pascal is also a very complete Pascal that enables you to do anything at all on the Mac. If it can be done within the limits of memory, Mac Pascal can do it, slowly perhaps, because it is interpreted. However, if you can find it inside Macintosh you can do it from Mac Pascal. When using Mac Pascal the syntax is checked for you and your mistakes pointed out (literally). You can run Mac Pascal in STEP-STEP mode and watch it execute a line at a time with the listing in one window, and the output in another.

Applications

Databases are starting to appear, but it's still too early to say if there are any clear front runners in this area. Three products that look good are MacLion, Helix and Microsoft File. A very powerful and feature packed database called Omnis III is almost ready for release (that sounds familiar). Some exciting early things in this area include Filevision which is a beautiful idea that has some funny limits like a maximum file size of 130K that forces you to break up large projects into chunks. I hope the

Continued on page 10

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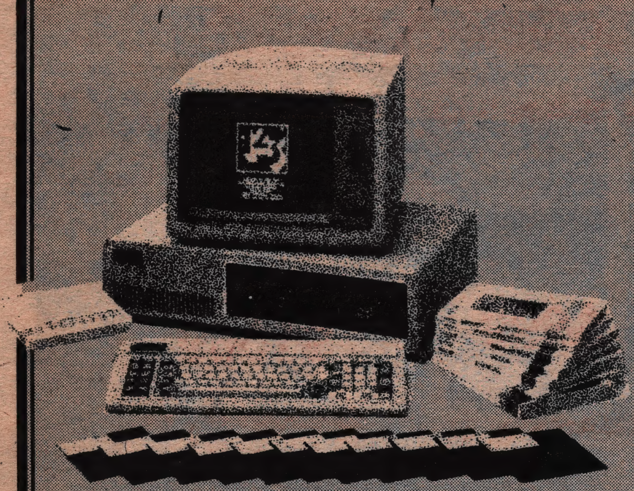

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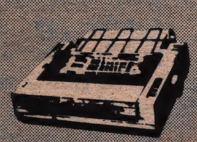

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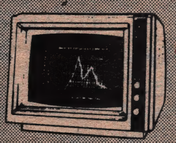

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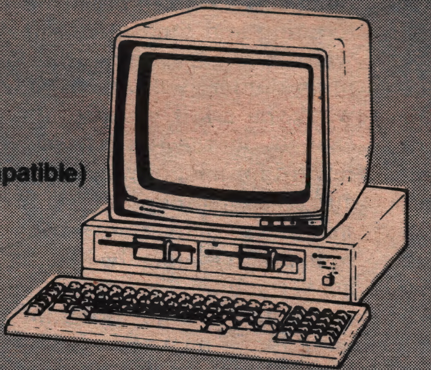

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First Anniversary

Continued from page 7

people at Telos don't give up, because in spite of some minor problems, they have a very good idea that seems to almost meet a lot of needs.

Mac Business

One of Apple's goals is to have the Macintosh become fully accepted in the corporate marketplace as a serious business computer. Apple will probably make it on the power of its LaserWriter, which is nothing short of fantastic. The AppleTalk network will help, as will the file server, but it must be remembered that the Mac finder doesn't yet handle hard disk directories well. The folders are just a convenient way of uncluttering the desktop. There is no true heirarcical file system on the Mac. The finder was designed for 400K diskettes and it cannot handle directories larger than 256 names. Apple is reportedly working on a new finder to enable the Mac to deal with double sided disks and the file server. The file server will be a disk drive accessable by any computer on the AppleTalk network. Several companies are readying products in this area. Apple's own file server won't be ready until summer. General Computer Co.'s HyperDrive (not a file server) breaks up its 10 mbyte internally mounted Winchester into virtual volumes as an interim solution to the limited number of file names.

There is little or no network software available for the AppleTalk net so far. It's just a raw shell. No electronic mail, the gateway to Ethernet (and thereby mainframes) is not ready yet. The real advantage the Mac has is that its users tend to be creative types who like the machine and will make do until reinforcements arrive. The LaserWriter is one of those things we didn't know we needed until we saw it. As the Xerox copier created a need for copies and eliminated the spirit duplicator, mimeographs and carbon copies, so the LaserWriter will create a need for its output, and possibly create an additional need for tasteful use of its power. It is a truly superb machine that can give anyone with a Mac (it is designed to either read Mac disks, or communicate via the AppleTalk network) the ability to do the work of a small commercial typesetter. The LaserWriter is reason enough to get Macs for those companies that recognize the need. Eventually the rest of the world will catch up.

Who Are Mac People?

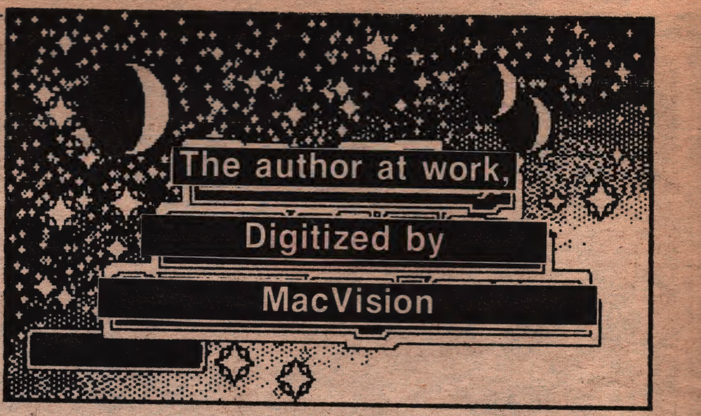
Who uses the Macintosh? The people who worked on the Mac design team were all highly creative individuals, and what they produced is not only "A computer for the rest of us" as Apple claims, but also a computer for highly creative people. It seems to have become the computer of choice for people who write, those who do layout work and artists. There are several video digitizers, a fantastic product called "Thunderscan" which turns the Imagewriter into a digitizer that can scan photos and drawings, and at least one high quality graphics tablet with a resolution several times greater than the screen.

It is also the current favorite of hackers. It offers a lot to someone who knows how to program it. The Mac seems to be today's hacker machine and that means that it is probably tomorrow's source of really interesting and innovative software. You can always find a programmer willing to do what you ask if you pay him enough, but the Mac is its own reward for a lot of very clever and creative programmers. In spite of the complexities involved in programming the Mac, it holds the undivided attention of people who enjoy programming for its own sake. It will probably pay off in good software.

There is a philosophical argument that human languages affect and possibly inhibit the creative process by limiting the way in which ideas can be combined. Possibly the Mac, with its radically different user interface will open new avenues of thought and open the door to new uses for computers, that we, still stuck in a traditional rut, can't see yet. The Mac may show the way.

Mac Future

Beside the excitement of newer, better and easier to use software that makes the Mac's future look interesting there is already a hint of what tomorrow holds. There is talk of a "Flat Mac". Alan Kay's original Dynabook is beginning to look like a distinct possibility. Not only has Steve Jobs alluded to it in public, but Apple has been looking at flat screen technology for some time, and Alan Kay is on the team. So far, on new machine introductions (if you discount the hobbyist Apple I) Apple is batting .500 and learning from their mistakes. The book "The Little Kingdom" by Michael Moritz contains a description of Steve Jobs holding a Mac III that is the size of a desk diary. Since then the term "Flat Mac" has come into existence. One line of descent for the 68000 chip is the 68020 which is a faster, more sophisticated version of its progenitor that not only addresses more memory, but is supposed to be available in a CMOS version perfect for portable computing. The Flat Mac will probably be as exciting in person as reading about Alan Kay's Dynabook was ten years ago.



The things that the Mac made available at the consumer level are gradually permeating the world of personal computers. In fact, if imitation is the sincerest form of flattery than the Mac is a widely flattered machine. Software packages like "SideKick" from Borland make Mac like desk accessories available to the users of older machines. MacPaint is the most widely copied piece of software since Visicalc. Everyone suddenly discovered the need to draw, and with the right tools it becomes easy and fun. The Mac has the right tools, so it showed the way. The windowing concept is also widely and often poorly imitated, on machines other than the Mac. The mouse is possibly the most criticized feature of the Mac and even that is rapidly becoming available for other machines.

The Mac's extensive graphics capabilities combined with the LaserWriter and the various digitizers and graphic support devices available for it create a unique tool that can do more for less money than anything that was ever seen before. This is where the Mac has no competition and its strongest appeal both as a artist's medium and a business tool. Expect a revolution in taste in the next few years as the world discovers the ease of widely disseminating poorly thought out and exquisitely produced documents.

Only time can tell if Apple can loosen IBM's hold on the bulk of the business market, but however the battle goes the Mac has made its mark in the field and its introduction is a milestone in personal computing. Mac has established its place as the computer for the creative side of business and it will expand and solidify that base as time passes. ●

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MacVision — Hardware Review

by L.J. Kutten

MacVision is one of a number of digitizers that have recently burst upon the Macintosh scene. It will accept an input video image from a variety of sources and convert it into an image that can be viewed on the Macintosh computer screen. The image can be stored on a diskette and later manipulated by the computer.

MacVision creates a MacPaint document when it stores an image. This means the document can be edited by MacPaint and loaded into MacWrite and Microsoft Word documents. According to Koala any MacVision document can be loaded into any Macintosh application that will accept MacPaint images.

Using MacVision is very simple. First the hardware must be set up. This requires two connections to be made. First the MacVision unit must be connected to an input device. This can be a TV camera, a video cassette recorder, a video disk player, or any other device that has a RS-170 output connector. In theory this means MacVision can be attached to a video game machine.

The second connection is attaching MacVision to the Macintosh. It plugs into either the modem or printer port. This means you lose use of one of them. If you plan to print out your document, use the modem port. Otherwise you will be constantly connecting and disconnecting cables. MacVision does not require an external power supply.

MacVision works as a desktop accessory. This means it can be installed on any application disk and used at any time provided there is enough memory. However, on a 128K Macintosh, the system will sometimes crash as there is insufficient memory with certain applications.

Once the connections are made, MacVision is simple to use. Pull down the MacVision menu bar and select an option. At first select "Scan Window." A small window will appear and the input image will be

Continued on page 13

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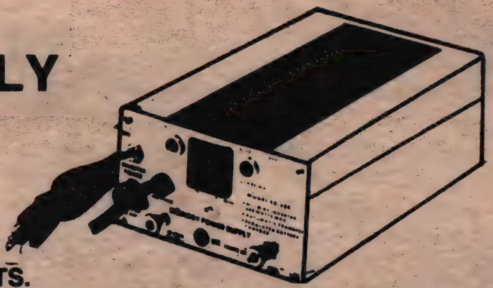

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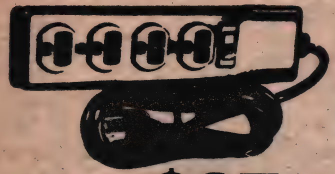

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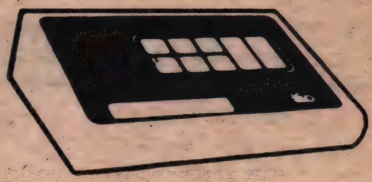

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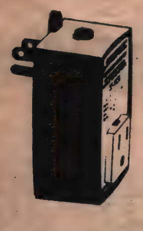

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Editorial

By Stan Veit

The Execution Of A Magazine

Ziff Davis has killed *Computers & Electronics* the computer magazine with the largest circulation in the world! I felt very bad when they killed Microsystems. I feel even worse about this execution, because I was Technical Editor of *Computers & Electronics* before I became Editor of *Computer Shopper*. I found out about the demise when my ex-boss Art Salsberg (former Editorial Director) called me to break the news. Art is now Editor and Publisher of *Modern Electronics,* and he was quite upset about *C & E* until I said to him, "Art, we had our wake when *Popular Electronics* died, nobody expected *C & E* to make it under the restrictions placed on it by ZD management."

Popular Electronics was the magazine from which a whole generation learned about the wonders of electronics, during the most exciting era, when computers, lasers, integrated circuits, microchips, video, audio, atomic physics, space travel and communications developed.

Popular Electronics had a circulation of 450,000 and a loyal following of subscribers who signed up every three years like voting. I have held many different jobs in my lifetime but one title I was proudest of was Computer Editor of *Popular Electronics magazine.*

What is a magazine? It is a collection of articles and ads that takes on a personality from those who write and edit it. *Popular Electronics* was Forrest Mims, Leslie Solomon, Walter Buchsbaum, Al Brawra, Stan Veit, and many other writers and editors. It was Art Salsberg, John Riggs, the artists, and production people. It was also a wonderful money maker for Ziff Davis.

Why then was it changed to *Computers & Electronics* and then killed? For an answer to that question you have to go back to 1975 when *Popular Electronics* launched the personal computer revolution with the publication of the Altair article. The people on the staff at that time wanted to start a personal computer magazine, but Ziff Davis wanted no part of the idea (Computers! Bah! Humbug!). Two years later when McGraw /Hill was making a lot of money with *BYTE,* (a magazine McGraw/Hill had bought right under Ziff Davis's nose), ZD was green with envy. They bought-up David Ahl's *Creative Computing magazine* and David's mini-empire, but Creative is a different kind of magazine and was not a big enough vehicle for ZD's expansive dreams. They wanted something large, something as big as *Byte!*

Larry Sporn, president of the newly born computer division of Ziff Davis, decided to change *Popular Electronics* into *Computers & Electronics.* The 450,000 circulation of *PE* would automatically make the "new" magazine the largest computer magazine in the world! Sporn's plans for *C & E* included making Leslie Solomon and I the Gurus of the magazine. Les was to write a column "Leslie Solomon On Hardware" and I was to write "Veit On Software," Forrest Mims was to be the Electronics Scientist, (the sole remainder of Electronics in the title)! Our art was to be jazzed up, brought into the NOW world of abstract color and design. I think what Sporn had in mind was a sort of "Time" of computers, but we never did find out. It didn't work, Les and I were too technical for management with our circuit diagrams and talk of DOS, UNIX and CP/M. We did not "sparkle." When the powers-that-be in ZD, made Art Salsberg lay the law down to me about the level of technical discussion I could engage in, I left for Florida and *Computer Shopper.* Les, near to retirement just sat and wrote the same kind of intelligent articles he was famous for. Art Salsberg even managed to print some of them once in a while, circuit diagrams and all. To complete the transition, they got rid of Art and brought in a new editorial director.

Finally they had the kind of magazine they wanted. Lots of color, modern design, real attractive typography. The articles were somewhat informative but they lacked any personality or innovative ideas. You read about nothing new in *C & E.* The magazine never found its own readership and the *Popular Electronics* readers did not renew. Advertisers melted away.

Now it is just a memory, and a lesson, big isn't always good! RIP-Computers & Electronics magazine, orphan child of *Popular Electronics.* Oh! in case you are interested, you can read just about the same type of articles originally featured by *Popular Electronics* by reading *Modern Electronics magazine* and *Computer Shopper,* many of the PE writers contribute to these magazines.

Macintosh After One Year

The theme of this issue is Apple's Macintosh the most talked about computer in the industry. Apple introduced Mac as "The Computer For the Rest of US," last year. This year Apple made some major change in the Macintosh concept to gain acceptance by the business world, providing enough memory to gain some badly needed software support from software publishers.

It seems that the world of "knowledge workers," as Apple called them, are perfectly happy to be lemmings, marching in step with IBM. They would rather be doing productive work with such "boring" programs as Lotus 1-2-3 and WordStar than using the mouse with MacPaint and MacWrite.

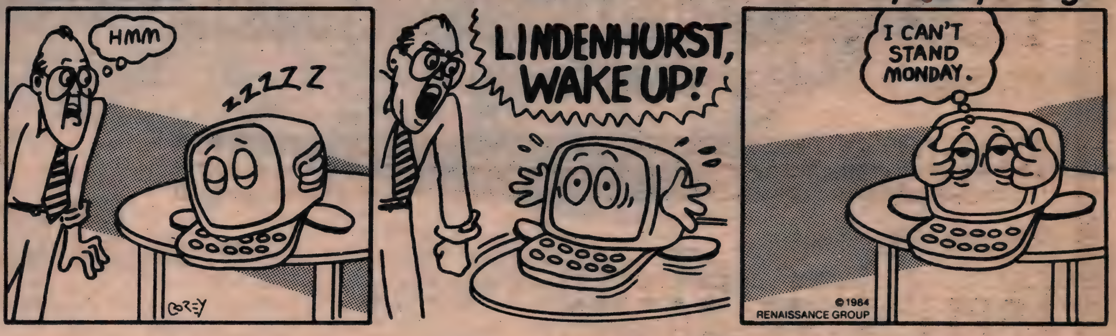
Apple quickly came out with Fat Mac (512K) and the promised second disk drive, only then did the expected software start to emerge. The next Apple introduction was The Apple Office, a network of Mac's using AppleTalk a low cost network and a high priced Laser Printer that could reproduce the graphics drawn on the Mac and had excellent text characters using standard type fonts. The Laser Printer at $7,000 is only a network server not a "printer for the rest of us." The Macintosh Office is Apple's latest attempt to find the niche in the business world that they haven't had since the Apple II+ and Visicalc. Although AppleTalk and The Macintosh Office have much to recommend them and will be supported by heavy sales promotion, marketing experts doubt, they can make significant inroads in the corporate market in the face of competition from IBM and AT&T.

One section of business where the Mac has already left its mark is in the related fields of graphics, publishing and design. The use of Mac to compose and preview graphic designs has already proven to be very valuable. Used with electronic imaging devices, and video cameras, Macintosh has become a business tool in the creative industries. However this niche does not seem to be enough for the ambitions of Apple computer.

AT&T Tries New Machine

I see in the New York Times, that AT&T is about to introduce its long awaited PC 7300 computer from Convergent Technologies. To those not familiar with Convergent they make a well respected M68000 multi-user system. AT&T has designed and Convergent will build a new machine, the PC 7300. This will also be a 68000 multi-user system with graphic capabilities. Naturally the PC 7300 will be a UNIX based system, but just what version of UNIX will be supported I do not know. UNIX V has been the version AT&T has supported as a "standard." One of the interesting things about this bit of news was that it was first "leaked" to the New York Times. The computer press was not advised, or even sent a press release. Now that the cat is out of the bag, (to a vast chorus of yawns), we can expect a press announcement. Why is this giant company so inept in press relations? Is it a symptom of AT&T's inability to "reach out and touch someone" in the field of computer marketing? ●

LINDENHURST **by Corey Strongin**



MacVision Continued from page 10

scanned across it. Each scan takes approximately six seconds. The image will be continually scanned until MacVision is told to stop. To stop the scan at the end of the window, click the mouse once. A double click stops it immediately.

Once you are satisfied with the window scan, do a "Scan Screen." This creates an image the size of the Macintosh window and takes 22 seconds. It can be stopped the same way as window scan.

The scanned images can be saved at any time by selecting save screen from the MacVision menu bar. The image will be saved to disk. You cannot select the file-name or the drive. Once the image is saved, pressing the space bar clears the screen. MacVision also has a built in print capability. It is limited to draft quality.

The manual with MacVision is adequate. It is 15 pages and covers setting up the hardware and software, how to use the program, and lighting instructions.

Other considerations: To fully utilize MacVision's capabilities, a TV camera, a tripod, and additional lighting are required. The tripod is needed to stabilize the camera. As it takes a minimum of six seconds to scan any item, the camera must remain stable. If not, the picture will be distorted. The lighting is required to provide good contrast and brightness on the object being scanned. Without the right amount, the resulting picture will be unsatisfactory. If you do not presently own a camera, tripod, and lights, assume a minimum expenditure of $200.

Conclusion: I liked MacVision. It was easy to set up and use. My only hesitation about recommending it is that I do not feel it is all that useful. The manufacturer lists two pages of ideas on how to best utilize it. Among its suggestions are scanning charts and graphs for inserting into documents, creating camera ready art, customized Christmas cards, and "showing off new family members." This is fine, if you will be satisfied with a MacPaint quality document. Personally, I was not.

MacVision
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video camera)

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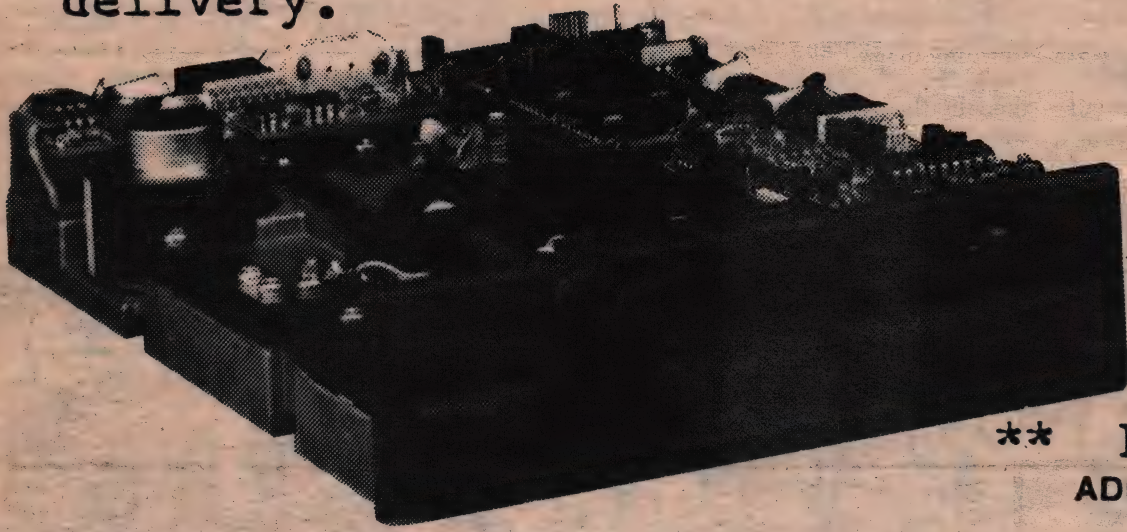

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Letters From Our Readers

Dear Randy Holcomb,

In the first three issues of "The Computer Shopper" for 1985, CorComp has either been the object of praise or criticism. Unfortunately the sting of criticism seems to always out weigh the impact of a compliment. I would like to take this opportunity to respond to your comments concerning our products and the credibility of our company.

CorComp's credibility is directly related to the reputation of our products and must be addressed. In your February article you stated that you had learned — although not confirmed — that we had filed a Chapter 11. You may have been the last to know. We did file in September and immediately notified the users groups, dealers and distributors through our first issue of the "CorComp Cursor," through direct correspondence from my office and by official notice by the courts to those in the status of creditors to the company. The Source and Compu-Serve have been riddled with discussion about our situation since the announcement. All calls and letters concerning our status have been answered. Several user group newsletters have included extensive interviews with me detailing our situation and progress in reorganization. I feel that the fears of our closing the doors have been satisfactorily dispelled.

If you are familiar with the Chapter 11 statue, you know that although it is under the Federal Bankruptcy Court its purpose is for reorganization. It is granted only to companies that showed significant promise of turning their financial position around. CorComp qualified and has made substantial gains in that direction during the last six months.

We have many new faces on our team each with a positive attitude, company loyalty and determination for a successful future. Our ability to continually tackle the design challenges of the Disk Controller while retaining an image of leadership is to their credit.

We stand behind our products and are up-front with end users, dealers and distributors. We have experienced some stumbling blocks in developing a full service Customer Service Department, however we have put a full service policy in place for both in warranty and out of warranty service. We have technical staff available to talk with anyone having a problem with our products or system problems that they cannot pinpoint. We are a small company that has been expected to function as a replacement for TI with its vast personnel and resources. I believe we have done an excellent job considering the challenge.

Our new engineering staff has completed the 9900 MICRO EXPANSION SYSTEM which is now in full scale production. It received extensive testing in Beta sites

Continued on page 20

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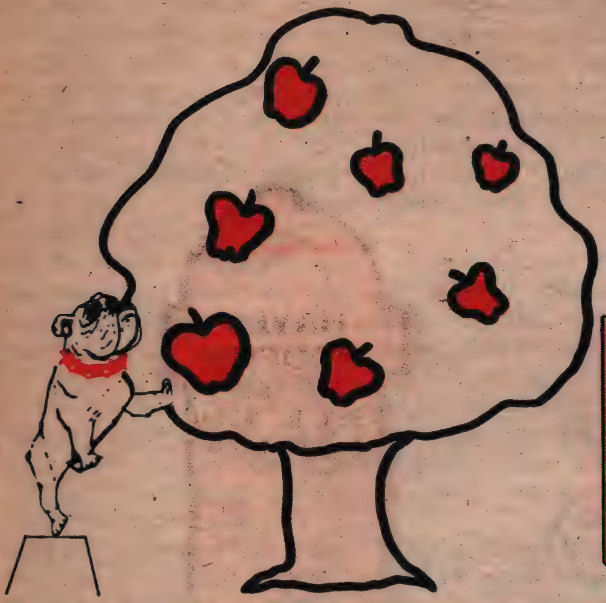

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Feedback Forum
Continued from page 15

throughout the country for five weeks before going to production or distribution. The reviews have been outstanding as exemplified in the second issue of the "Cursor". I would be happy to make a unit available for your review.

Every company reflects the attitudes of its management. CorComp is successfully reorganizing. I would appreciate it if prior to commenting on rumors concerning CorComp in the future you would give me the opportunity to confirm or explain our position.

Jackirae Sagouspe
President, CorComp

First, my apologies for not contacting you direct in regards to your Chapter 11 reorganization. In terms of timeframe in which that statement appeared; the lead time for writing an article to its publication can be very long (up to 3 months) and also the issue date is typically a month in advance (i.e. receiving the February issue in January) to further confuse the timeline of appearances of articles.

In the letter you mentioned that your credibility is related to the reputation of your products, and proceed to talk about how the company is weathering the Chapter 11 storm. However, the real issue is with the quality of the product, and that reputation, quite frankly didn't quite live up to standards as has been mentioned here, on CompuServe, the Source, and by several dealers that I have talked to in my area.

I was one of the first people to have the CorComp card and found out all too quickly about being a pioneer — so it went back and it was fixed; and worked fine for 32½ months. In November 1984 the card died and I returned the card for repair; only to have it show up defective. Once again I returned the card for service and AGAIN it did not function correctly in my system. Finally, the last card sent out in February 1985 has proven itself to be in working order. I had the drives cleaned and aligned on the first and third shipments of repair; both times the drives were certified to be capable of double-density operation.

Since the dealer where I purchased the card from was unavailable for many months to acquire additional cards, they dropped CorComp from their lines; subsequently I had to send the card back for service; all told I spent over $30 in postage to send the card back, not once, but several times to correct deficiencies in the product over a period of three months.

Product failures are not uncommon especially in our industry, but when an inordinate amount of time and resources did not rectify deficiencies with a product it acquires a reputation which is not easy to shake, and with many different individuals stating that they are having problems with CorComp products this has happened not only with the Disk controller card but with the RS232 card as well. It also seemed that when there was one voice singing praise there was at least one voice with a dissenting view — no one has control over that voice and unless the dissenting voice can be saited (either with a functioning product or a refund) it just can't be tossed aside.

I still stand by my review of the card (repairs and returns notwithstanding) and with my suggestions for individuals who desire to purchase the product. If the controls that you mention are in place and working at CorComp then the marketplace will let it be known that the product and company are successful — especially considering that less than 10% of the companies entering Chapter 11 never make it out.

As an individual, I will be looking forward to future product releases from CorComp with the hope that my experiences with the Disk Controller was just a bad dream.

Dear Mr. Fields,

Thank you for the kind mention of our national users group in your April feature article on Sanyos.

I really enjoy, and have for some time now, your magazine. We shall recommend it in our Newsletter as a must for all our fellow Sanyo users.

Keep up the good work! The article was excellent, as are all articles I've read in your publication. I'll see that you are put on our Newsletter mailing list, as soon as we begin regular publication.

Merlin S. Gagle, Jr.
Managing Editor/Pres.

Dear Editor,

I write to applaud your decision to introduce a HEATH/ZENITH section, and to applaud the direction in which apparently you intend to direct that section.

S-100 computers and HEATH computers represent the remains of true enthusiasts' machines. Their continued existence and indeed further development is one of the few possible safeguards against the entire field of microcomputers being swallowed by one huge (and not very enterprising) company.

The "IBM-compatible" machine recently marketed by the ZENITH company can of course be covered just as well in your IBM columns. But the H89 and the H8 deserve to be kept alive not only for their many current users but also to inform the newcomers of these great machines.

How many people starting with computers nowadays know that you can hook up whatever disk drives you want to your machine just by inserting the correct controller cards and using a versatile operating system? And that includes 8" as well as 5.25", double density as well as single density, double sided as well as single sided.

May we please hear about 16-bit 8086 plans for the H89 and H8? May we please have a review article (not an advertising article) about the H-1000 put out by TMSI; may we hear about their failure to provide an 8087 on the H-1000? May we hear the latest about how TRIONYX keeps the H8 alive and about THEIR plans for an H8 8086 board. May we have review articles about the relative merits of controller boards made for the H89 and H8 by companies other than HEATH. May we have the latest gen on what ZENITH is doing to HEATH?

H.H. Spencer
New Brunswick, NJ

Dear Editor,

I want to thank you and Don Lancaster for the Applewriter ProDOS version Grappler repair program published in your March '85 issue. Having just picked up the new ProDOS version of my old favorite, so that I could run using my new Sider hard disk from 1st Class Peripherals, I was stunned when my first printouts looked weird beyond belief.

Knowing that I could run the ProDOS version of Applewriter with my IIc and Imagewriter, didn't help me. It looked like my old EPSON was finally down for the count. Of course, calls to dealers, and to Apple produced everything from silence to denials. Lancaster's program did the trick.

This raises some hard issues for Apple however. The same thing happened when Appleworks first came out. Then a patch called "Grappleworks" circulated through the underground which allowed Grapplers to run with Appleworks, and again, the devil take other parallel interface cards. Not even Apple's own parallel card will run with Appleworks without minor screwups. So what has happened here.

In an interview that I remember published someplace, WOZ said that in order to write software for the Apple, one needs to know all the old tricks, the history and the undocumented innards of the system. Now that WOZ has left, are we going to see more and more Apple products that are de facto "closed system". What is clear is that people like Don Lancaster are few and far between, and it takes people at that skill level to enable users with mixed bags of hardware to use the new software. While your publication is performing a great public service in this regard, isn't this really Apple's job, part of what we pay those fancy prices to get?

George Danziger
Leverett, MA

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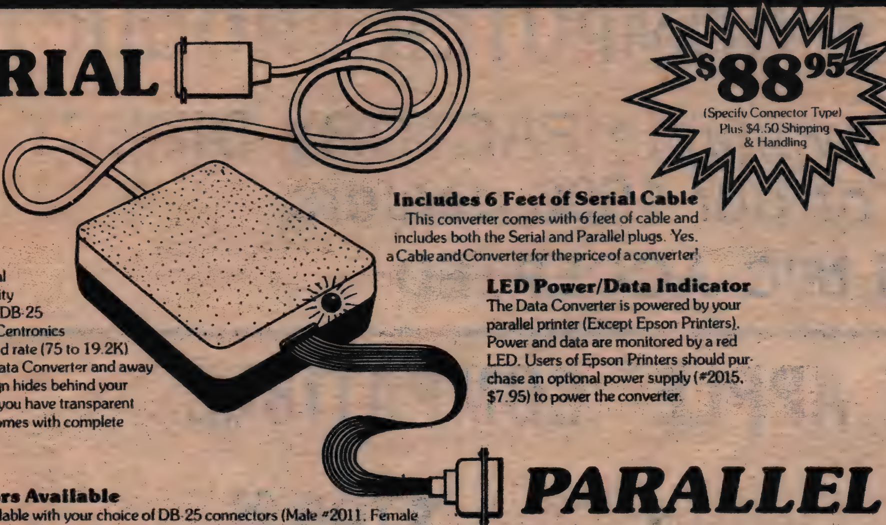

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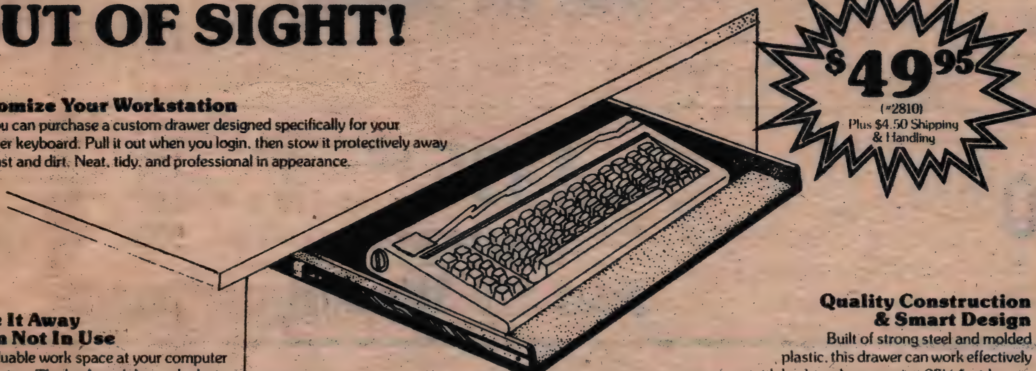

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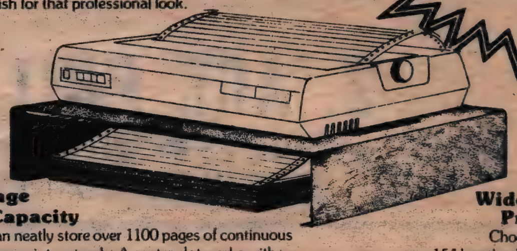

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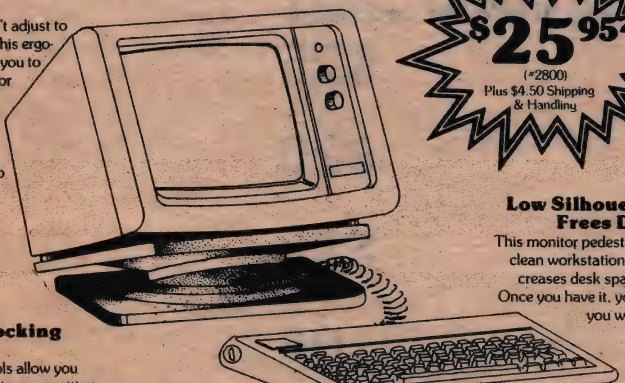

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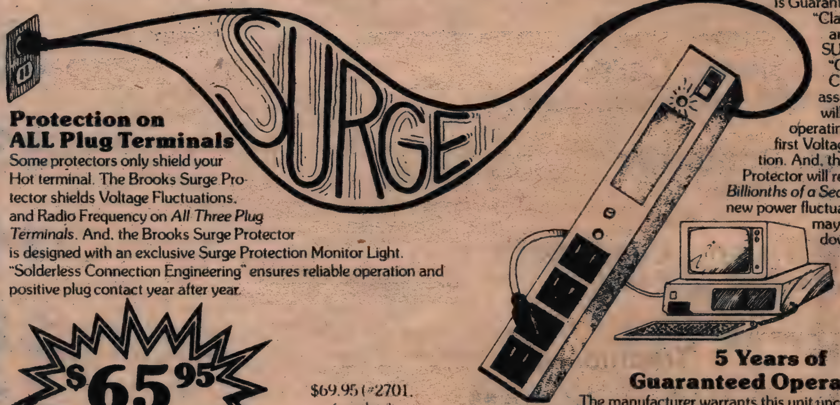

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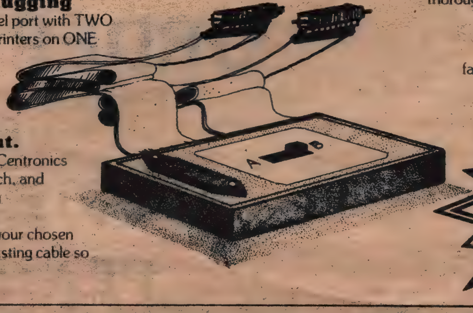

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Star SD10	352
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Star SR10	461
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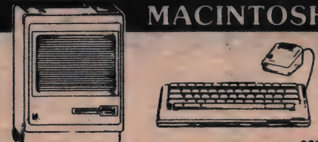

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SixPak Plus, 256K, S/P/CC + S/W	$ 695	$ 395
SixPak Plus, 384K, S/P/CC + S/W	$ 895	$ 465
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Preview™ Graphics Card w/para, 64K	$ 399	$ 299
Advantage™ Multif. Bd. for AT, 128K	$ 595	$ 445
I/O Plus II, S/P/CC	$ 215	$ 150
I/O Plus II, S/P/CC/G	$ 265	$ 185
I/O Plus II, 2S/P/CC/G	$ 315	$ 215
Port Kits - ser, para, or game, ea.	$ 50	$ 39
MonoGraphPlus™ P/CC (for Lotus)	$ 495	$ 375
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PCNet, Circuit Board, PC001	$ 695	$ 365
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Mach III (PC or Jr.)	$ 55	$ 35
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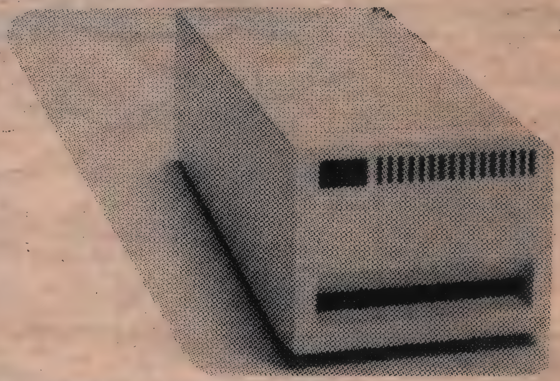

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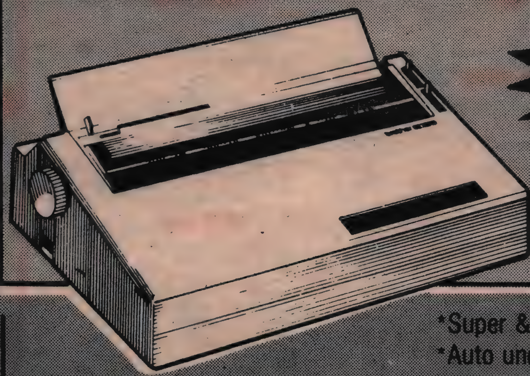

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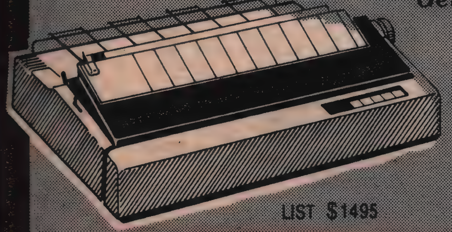

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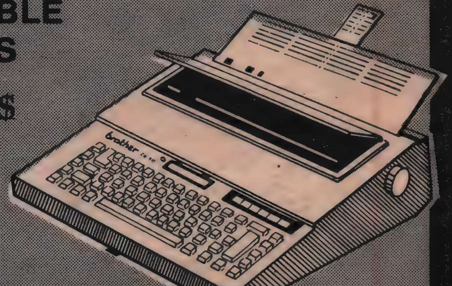

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SN7494N	14	.89
SN7495N	14	.49
SN7496N	16	.49
SN7497N	16	3.25
SN74100N	24	1.95
SN74105N	14	1.19
SN74107N	14	.29
SN74109N	16	.39
SN74116N	24	1.49
SN74121N	14	.45
SN74122N	14	.69
SN74123N	16	.55
SN74125N	14	.49
SN74126N	14	.49
SN74128N	14	.79
SN74132N	14	.59
SN74136N	14	.69
SN74141N	16	.89
SN74142N	16	3.95
SN74143N	24	3.95
SN74144N	24	3.95
SN74145N	16	.65
SN74147N	16	1.29
'SN74148N	16	.89
SN74150N	24	1.49
SN74151N	16	.49
SN74152N	14	.49
SN74153N	16	.99
SN74154N	24	1.49
SN74155N	16	.49
SN74156N	16	.59
SN74157N	16	.49
SN74159N	24	1.95
SN74160N	16	.59
SN74161N	16	.59
SN74162N	16	.59
SN74163N	16	.59
SN74164N	14	.69
SN74165N	16	.69
SN74166N	16	.69
SN74167N	16	2.95
SN74170N	16	1.59
SN74172N	24	4.95
SN74173N	16	.85
SN74174N	16	.59
SN74175N	16	.59
SN74176N	14	.79
SN74177N	14	.79
SN74179N	16	1.49
SN74180N	14	.69
SN74181N	24	1.95
SN74182N	16	1.05
SN74184N	16	2.29
SN74185N	16	2.29
SN74190N	16	.69
SN74191N	16	.69
SN74192N	16	.69
SN74193N	16	.69
SN74194N	16	.69
SN74195N	16	.49
SN74196N	14	.75
SN74197N	14	.75
SN74198N	24	1.19
SN74199N	24	1.19
SN74221N	16	1.19
SN74251N	16	.79
SN74273N	20	1.95
SN74276N	20	2.49
SN74279N	16	.79
SN74283N	16	1.39
SN74284N	16	2.95
SN74285N	16	2.95
SN74365N	16	.55
SN74366N	16	.55
SN74367N	16	.55
SN74368N	16	.55
SN74390N	16	1.49
SN74393N	14	1.49

74LS

Part No.	Pins	Price
74LS00	14	.29
74LS01	14	.29
74LS02	14	.35
74LS03	14	.29
74LS04	14	.39
74LS05	14	.35
74LS08	14	.35
74LS09	14	.35
74LS10	14	.35
74LS11	14	.35
74LS14	14	.59
74LS15	14	.35
74LS20	14	.29
74LS21	14	.35
74LS26	14	.29
74LS27	14	.35
74LS28	14	.39
74LS30	14	.39
74LS32	14	.39
74LS37	14	.35
74LS38	14	.39
74LS42	16	.49
74LS47	16	.89
74LS51	14	.29
74LS73	14	.39
74LS74	14	.49
74LS75	16	.45
74LS76	16	.39
74LS85	16	.89
74LS86	14	.39
74LS90	14	.55
74LS92	14	.55
74LS93	14	.59
74LS96	16	.89
74LS107	14	.39
74LS109	16	.39
74LS112	16	.45
74LS114	14	.39
74LS122	14	.49
74LS123	16	.79
74LS125	14	.59
74LS126	14	.59
74LS132	14	.65
74LS133	16	.59
74LS136	14	.39
74LS138	16	.59
74LS139	16	.59
74LS145	16	1.19
74LS147	16	1.95
74LS148	16	1.79
74LS151	16	.59
74LS153	16	.59
74LS154	24	1.49
74LS155	16	.69
74LS156	16	.69
74LS157	16	.69
74LS158	16	.59
74LS160	16	.69
74LS161	16	.69
74LS162	16	.69
74LS163	16	.69
74LS164	14	.89
74LS165	16	.89
74LS168	16	1.19
74LS169	16	1.49
74LS170	16	1.49
74LS173	16	.69
74LS174	16	.69
74LS175	16	.69
74LS181	24	2.49
74LS190	16	.79
74LS191	16	.89
74LS192	16	.79
74LS193	16	.89
74LS194	16	.69
74LS195	16	.59
74LS196	14	.89
74LS197	14	.89
74LS221	16	1.09
74LS240	20	1.09
74LS241	20	.99
74LS243	14	1.09
74LS244	20	1.29
74LS245	20	1.49
74LS251	16	.59
74LS253	16	.59
74LS257	16	.59
74LS258	16	.59
74LS260	14	.59
74LS266	14	.49
74LS273	20	1.49
74LS279	16	.49
74LS280	14	1.95
74LS299	20	2.95
74LS322	20	3.95
74LS323	20	3.95
74LS347	16	.79
74LS353	16	1.09
74LS364	20	1.95
74LS365	16	.49
74LS366	16	.49
74LS367	16	.49
74LS368	16	.49
74LS373	20	1.49
74LS374	20	1.49
74LS375	16	.69
74LS386	14	.39
74LS393	14	1.19
74LS399	16	1.49
74LS490	16	1.95
74LS533	20	1.95
74LS534	20	1.95
74LS540	20	1.49
74LS541	20	1.49
74LS640	20	2.19
74LS641	20	2.19
74LS644	20	2.19
74LS645	20	2.19
74LS670	16	1.49
74LS688	20	2.95
81LS95	20	1.49
81LS96	20	1.49
81LS97	20	1.49
81LS98	20	1.49

74S/PROMS*

Part No.	Pins	Price
74S00	14	.35
74S02	14	.35
74S03	14	.35
74S04	14	.45
74S05	14	.45
74S08	14	.45
74S09	14	.39
74S10	14	.35
74S11	14	.35
74S15	14	.35
74S20	14	.35
74S22	14	.35
74S30	14	.35
74S32	14	.45
74S37	14	.99
74S38	14	.89
74S51	14	.35
74S64	14	.39
74S65	14	.39
74S74	14	.55
74S85	16	1.99
74S86	14	.55
74S112	16	.55
74S113	14	.55
74S114	14	.55
74S124	16	2.75
74S132	14	1.89
74S133	16	.45
74S135	16	.89
74S136	14	1.39
74S138	16	.89
74S139	16	.89
74S140	14	.69
74S151	16	.99
74S153	16	.99
74S157	16	.99
74S158	16	.99
74S160	16	2.29
74S169	16	4.29
74S174	16	1.09
74S175	16	1.09
74S188*	16	1.75
74S194	16	1.49
74S195	16	1.49
74S196	14	1.49
74S240	20	1.95
74S241	20	1.95
74S242	14	2.19
74S243	14	2.19
74S244	20	2.19
74S251	16	.99
74S253	16	.99
74S257	16	.99
74S258	16	.99
74S260	14	.79
74S273	20	2.39
74S280	14	1.89
74S287*	16	1.79
74S288*	16	1.79
74S299	20	5.95
74S373	20	2.49
74S374	20	2.49
74S387*	16	1.95
74S471*	20	4.95
74S472*	20	4.95
74S473*	20	4.95
74S570*	16	2.95
74S571*	16	2.95
74S572*	18	4.95
74S573*	18	4.95

CA—LINEAR

Part No.	Pins	Price
CA3010H		1.09
CA3039H		1.25
CA3046N	14	.99
CA3059N	14	2.95
CA3060N	16	2.95
CA3065E	14	1.49
CA3080E	8	.99
CA3081N	16	1.15
CA3082N	16	1.15
CA3083N	16	1.15
CA3086N	14	.85
CA3089N	16	1.95
CA3096N	16	1.75
CA3130E	8	1.19
CA3140E	8	.85
CA3160H		1.79
CA3160E	8	1.49
CA3161E	16	1.79
CA3162E	16	6.95
CA3189E	16	2.79
CA3401N	14	.59

CD—CMOS

Part No.	Pins	Price
CD4001	14	.29
CD4002	14	.29
CD4006	14	.89
CD4007	14	.29
CD4008	16	.89
CD4009	16	.59
CD4010	16	.49
CD4011	14	.29
CD4012	14	.29
CD4013	14	.39
CD4014	16	.89
CD4015	16	.39
CD4016	14	.49
CD4017	16	.79
CD4018	16	.79
CD4019	16	.49
CD4020	16	.75
CD4021	16	.75
CD4022	16	.75
CD4023	14	.29
CD4024	14	.69
CD4025	14	.29
CD4026	16	1.59
CD4027	16	.45
CD4028	16	.69
CD4029	16	.79
CD4030	14	.39
CD4034	24	1.79
CD4035	16	.79
CD4040	16	.75
CD4041	14	.69
CD4042	16	.69
CD4043	16	.79
CD4044	16	.79
CD4046	16	.89
CD4047	14	.89
CD4048	16	.59
CD4049	16	.39
CD4050	16	.39
CD4051	16	.79
CD4052	16	.89
CD4053	16	.79
CD4056	16	2.95
CD4059	24	3.95
CD4060	16	.89
CD4066	14	.45
CD4068	14	.39
CD4069	14	.35
CD4070	14	.29
CD4071	14	.29
CD4072	14	.29
CD4073	14	.29
CD4077	14	.35
CD4078	14	.49
CD4081	14	.29
CD4093	14	.49
CD4094	16	1.95
CD4098	16	1.95
CD4099	16	1.89
CD4503	16	.69
CD4506	16	1.29
CD4507	14	1.19
CD4508	24	1.95
CD4510	16	.85
CD4511	16	.85
CD4512	16	.85
CD4514	24	1.49
CD4515	24	1.49
CD4516	16	.89
CD4518	16	.89
CD4519	16	.59
CD4520	16	.89
CD4526	16	1.19
CD4528	16	1.19
CD4529	16	1.69
CD4531	16	.89
CD4538	16	1.49
CD4541	14	1.49
CD4543	16	1.19
CD4562	14	6.95
CD4566	16	2.95
CD4583	16	2.49
CD4584	14	.59
CD4723	16	1.19
CD4724	16	1.19
MC14410	16	8.95
MC14411	24	11.95
MC14412	16	7.95
MC14433	24	17.95
MC14572	16	1.19

(More in Catalog)

74F00

Part No.	Pins	Function	Price
74F00	14	Quad 2-Input NAND Gate	.69
74F02	14	Quad 2-Input NOR Gate	.75
74F04	14	Hex Inverter	.89
74F08	14	Quad 2-Input AND Gate	.75
74F10	14	Triple 3-Input NAND Gate	.75
74F32	14	Quad 2-Input OR Gate	.79
74F74	14	Dual D Flip-Flop	.85
74F86	14	Quad Exclusive OR Gate	1.15
74F109	16	Dual JK Positive Edge Flip-Flop	.95
74F138	16	Expandable 3/8 Decoder	1.69
74F157	16	Quad 2-Input Multiplexer	1.69
74F158	16	Quad 2-Input Multiplexer (Inv.)	1.69
74F193	16	4-Bit Up/Down Binary Counter	5.29
74F240	20	Tri-State Octal Line Driver (Inverting)	3.75
74F244	20	Tri-State Octal Line Driver	3.49
74F257	16	Tri-State Quad 2-Input Multiplexer	1.79
74F373	20	Tri-State Octal Latch	4.89
74F374	20	Tri-State Octal D Flip-Flop	4.59

74ALS00

Part No.	Pins	Function	Price
74ALS00	14	Quad 2-Input NAND Gate	.59
74ALS02	14	Quad 2-Input NOR Gate	.59
74ALS04	14	Hex Inverter	.59
74ALS08	14	Quad 2-Input AND Gate	.59
74ALS10	14	Triple 3-Input NAND Gate	.59
74ALS30	14	8-Input NAND Gate	.59
74ALS32	14	Quad 2-Input OR Gate	.65
74ALS74	14	Dual D Flip-Flop	.79
74ALS109	16	Dual JK Pos. Edge Flip-Flop	.79
74ALS138	16	Expandable 3/8 Decoder	1.25
74ALS240	20	Tri-State Octal Line Driver (Inverting)	2.25
74ALS244	20	Tri-State Octal Line Driver	2.25
74ALS245	20	Octal Bus Transceiver (Non-Inv.)	2.59
74ALS373	20	Tri-State Octal Latch	2.59
74ALS374	20	Tri-State Octal D Flip-Flop	2.59

MICROPROCESSOR COMPONENTS

MICROPROCESSOR CHIPS

Part No.	Pins	Function	Price
D765AC	40	Floppy Disk Controller	16.95 ~~19.95~~
D3242	28	Addr. Multiplexer & Refresh Counter	7.95
TMS5501	40	Synchronous Data Interface (SIRC)	14.95

Z80, Z80A, Z80B, Z8000 SERIES

Part No.	Pins	Function	Price
Z80	40	CPU (MK3880N) (780C) 2.5MHz	2.75 ~~2.95~~
Z80-CTC	28	Counter Timer Circuit	3.49
Z80-DART	40	Dual Asynchronous Rec./Trans.	8.95
Z80-DMA	40	Direct Memory Access Circuit	12.49
Z80-P10	40	Parallel I/O Interface Controller	2.95 ~~3.49~~
Z80-S10/0	40	Serial I/O (TxCB and RxCB Bonded)	11.49
Z80-S10/1	40	Serial I/O (Lacks DTRB)	11.49
Z80-S10/2	40	Serial I/O (Lacks SYNCB)	11.49
Z80-S10/9	40	Serial I/O	11.49
Z80A	40	CPU (MK3880N-4) (780C-1) 4MHz	2.95 ~~3.49~~
Z80A-CTC	28	Counter Timer Circuit	3.95 ~~4.49~~
Z80A-DART	40	Dual Asynchronous Rec./Trans.	9.95
Z80A-DMA	40	Direct Memory Access Circuit	12.95
Z80A-P10	40	Parallel I/O Interface Controller	3.95
Z80A-S10/0	40	Serial I/O (TxCB and RxCB Bonded)	11.95
Z80A-S10/1	40	Serial I/O (Lacks DTRB)	11.95
Z80A-S10/2	40	Serial I/O (Lacks SYNCB)	11.95
Z80A-S10/9	40	Serial I/O	11.95
Z80B	40	CPU (MK3880N-6) 6MHz	8.95
Z80B-CTC	28	Counter Timer Circuit	11.95
Z80B-DART	40	Dual Asynchronous Rec./Trans.	19.95
Z80B-P10	40	Parallel I/O Interface Controller	10.95
Z8001B	48	CPU Segmented (10MHz)	79.95
Z8002B	40	CPU Non-Segmented (10MHz)	59.95

6500/6800/68000 SERIES

Part No.	Pins	Function	Price
6502	40	MPU with Clock (1MHz)	4.95
6502A	40	MPU with Clock (2MHz)	6.49
6502B	40	MPU with Clock (3MHz)	8.95
6520	40	Peripheral Inter. Adapter	3.95
6522	40	Versatile Inter. Adapter	5.49
6551	28	Async. Comm. Interface Adapt.	6.95 ~~10.95~~
6800	40	MPU	2.95
6802CP	40	MPU with Clock and RAM	5.95 ~~7.95~~
6809	40	CPU — 8-Bit (On-Chip Oscillator)	8.95
6809E	40	CPU — 8-Bit (External Clocking)	9.95
68B09E	40	CPU — 8-Bit (Ext. Clocking) 2MHz	14.95
68B10	24	128x8 Static RAM (2MHz)	5.95
6821	40	Peripheral Inter. Adapt. (MC6820)	2.75 ~~2.95~~
68B21	40	Peripheral Interface Adapter (2MHz)	5.95
6845	40	CRT Controller (CRTC)	9.95 ~~14.95~~
68B45	40	CRT Controller (CRTC) 2MHz	14.95 ~~19.95~~
6850	24	Asynchronous Comm. Adapter	3.95
6860	24	0-600bps Digital MODEM	7.95
68000L8	64	MPU 16-Bit (8MHz)	39.95
68488P	40	General Purpose Int. Adapter	9.95

8000/80000 SERIES

Part No.	Pins	Function	Price
8031	40	Control Oriented CPU w/RAM & I/O	12.95 ~~14.95~~
8035	40	MPU — 8-Bit	4.95 ~~5.95~~
8039	40	CPU—Sgl. Chip 8-Bit (128bts. RAM)	4.95 ~~5.95~~
8040N-6	40	CPU (256 bytes RAM)	9.95
8060	40	CPU — 8-Bit NMOS	12.95 ~~14.95~~
8073N	40	CPU w/Basic Micro Interpreter	29.95
8080A	40	CPU	3.95
8085A	40	CPU	4.95
8085A-2	40	CPU-8-Bit N-Channel (5MHz)	10.95 ~~11.95~~
8086-2	40	CPU 16-bit 8MHz	19.95 ~~24.95~~
8087	40	Arithmetic Processor	169.95 ~~189.95~~
8088	40	CPU 8/16-Bit	14.95 ~~19.95~~
8155	40	HMOS RAM I/O Port-Timer	4.95 ~~6.95~~
8156	40	RAM with I/O Port and Timer	6.95 ~~8.95~~
8205	16	Hi Speed 1 out of 8 Binary Decoder	3.95
8212	24	8-Bit Input/Output (74S412)	2.95
8224	16	Clock Generator/Driver	2.95
8228	28	Sys. Cont./Bus Driver (74S428)	3.95 ~~4.95~~
8237-5	40	High Perf. Prog. DMA Cont. (5MHz)	14.95 ~~19.95~~
8238	28	System Controller (74S438)	4.95
8243	24	I/O Expander for 48 Series	3.95 ~~4.95~~
8250N	40	Async. Comm. Element	10.95
8251	28	Prog. Comm. I/O (USART)	4.49 ~~4.95~~
8251A	28	Prog. Comm. Interface (USART)	4.95 ~~7.95~~
8253	24	Prog. Interval Timer	5.95 ~~6.95~~
8255	40	Prog. Peripheral I/O (PPI)	4.49 ~~4.95~~
8255A-5	40	Prog. Peripheral I/O (PPI) 5MHz	4.95 ~~7.95~~
8259	28	Prog. Interrupt Control	5.95
8272	40	Sgle/Dble Density Floppy Disk Cont.	16.95 ~~19.95~~
8274	40	Multi-Protocol Serial Cont. (7201)	14.95 ~~29.95~~
8279	40	Prog. Keyboard/Display Interface	6.95
8282	20	Octal Latch	6.49 ~~8.95~~
8284	18	Clock Generator/Driver	5.49 ~~6.95~~
8286	20	Octal Bus Transceiver	6.49 ~~7.95~~
8287	20	Octal Bus. Transceiver (Inverted)	6.49 ~~7.95~~
8288	20	Bus Controller	14.95 ~~19.95~~
8303	20	8-Bit Tri-State Bi-Directional Trans.	3.49
8304	20	8-Bit Bi-Directional Receiver	3.49
8310	20	Octal Latched Peripheral Driver	3.95
8741	40	8-Bit Univ. Peripheral Interface	19.95 ~~29.95~~
8748	40	HMOS EPROM MPU	19.95 ~~30.95~~
8749	40	MPU 8-Bit (EPROM Version of 8049)	24.95 ~~39.95~~
8755	40	16K EPROM with I/O	39.95
80186-6	68	High Integration 16-Bit MPU	99.95
80188	68	High Integra. 16-Bit MPU (8-Bit Data Bus)	89.95

SPECIAL FUNCTION

Part No.	Pins	Function	Price
DS0026CN	8	Dual MOS Clock Driver (5MHz)	1.95
INS2651	28	Communication Chip	7.95
MC3470P	18	Floppy Disk Read Amp System	4.95
MM5321N	16	TV Camera Sync. Generator	9.95
MM54240N	24	Asynchronous Transmitter/Receiver	5.95
MM58167AN	24	Microprocessor Real Time Clock	8.95
MM58174AN	16	Micro. Compatible Time Clock	8.95
MM5369AA/N	8	Prog. Oscillator/Divider (60Hz)	1.79
MM5369EST	8	Prog. Oscillator/Divider (100Hz)	1.95

DYNAMIC RAMS

Part No.	Pins	Function	Price
1103	18	1024x1 (300ns)	.99
4027	**16**	**4096x1 (250ns)**	**1.49**
4116N-15	16	16,384x1 (150ns)	1.39 — 8/10.95
4116N-20	16	16,384x1 (200ns)	.79-8/6.29 ~~1.15-8/8.95~~
4116N-25	16	16,384x1 (250ns)	.69-8/5.49 ~~.89-8/6.95~~
4164N-150	16	65,536x1 (150ns)	3.95-8/31.49 ~~5.19-8/40.95~~
4164N-200	16	65,536x1 (200ns)	3.75-8/29.95 ~~4.95-8/38.95~~
MM5261	18	1024x1 (300ns)	.35 — 8/1.95
MM5262	**22**	**2048x1 (365ns)**	**.35 — 8/1.95**
MM5270	18	4096x1 (250ns) MK4096	4.95
MM5280	22	4096x1 (200ns) 2107	3.95
MM5298-3	16	8192x1 (200ns)	.59
41256-150	16	262,144x1 (150ns)	15.95 ~~34.95~~
41256-200	16	262,144x1 (200ns)	13.95 ~~31.95~~
48128	16	131,072x1 (250ns)	24.95

STATIC RAMS

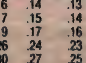
Part No.	Pins	Function	Price
2101	22	256x4 (450ns) 8101	1.95
2102	16	1024x1 (350ns)	.89
2102-2L	16	1024x1 (250ns) L.P. (91L02)	1.49
2111	18	256x4 (450ns) 8111	2.49
2112	16	256x4 (450ns) MOS	2.49
2114N	18	1024x4 (450ns)	1.29 — 8/9.95
2114N-L	18	1024x4 (450ns) L.P.	1.65 — 8/12.95
2114N-2	18	1024x4 (200ns)	1.39 — 8/10.95
2114N-2L	18	1024x4 (200ns) L.P.	1.69 — 8/13.49
2147HN	18	4096x1 (70ns)	4.49
2148HN	18	1024x4 (70ns)	4.95
TMS4045	18	1024x4 (450ns)	3.95
TMS40L47-45	20	1024x4 (450ns)	1.95
5101	22	256x4 (450ns) CMOS	3.95
MM5257	18	4096x1 (450ns) 4044	4.95
HM6116P-2	24	2048x8 (120ns) CMOS	7.95
HM6116LP-2	24	2048x8 (120ns) L.P. CMOS	8.95
HM6116P-3	24	2048x8 (150ns) CMOS	3.95 ~~4.95~~
HM6116LP-3	24	2048x8 (150ns) L.P. CMOS	4.95 ~~6.49~~
HM6116P-4	24	2048x8 (200ns) CMOS	3.75 ~~4.75~~
HM6116LP-4	24	2048x8 (200ns) L.P. CMOS	4.75 ~~5.49~~
HM6264P-12	28	8192x8 (120ns) CMOS	19.95 ~~37.95~~
HM6264LP-12	28	8192x8 (120ns) L.P. CMOS	21.95 ~~39.95~~
HM6264P-15	28	8192x8 (150ns) CMOS	16.95 ~~34.95~~
HM6264LP-15	28	8192x8 (150ns) L.P. CMOS	17.95 ~~37.95~~
27LS00	16	256x1 (80ns) L.P.	3.95
7489	16	16x4 (50ns) 3101	2.25
74C921	18	256x4 (250ns) CMOS	5.95
74C930	18	1024x1 (250ns) CMOS (6518)	5.95
74S189	16	16x4 (35ns) 93405	2.95
74S289	16	16x4 (35ns) 3101	2.95
82S10	16	1024x1 (50ns) O.C. (93415)	3.95
82S25	16	16x4 (50ns) O.C. (74S289)	2.25

PROMS/EPROMS

Part No.	Pins	Function	Price
1702A	24	256x8 (1μs)	3.95
2708	24	1024x8 (450ns)	3.95
TMS2516	24	2048x8 (450ns) 2716	4.95
TMS2532	24	4096x8 (450ns) NMC2532	5.49
TMS2564	28	8192x8 (450ns)	10.95
TMS2716	24	2048x8 (450ns) 3 voltage	7.95
2716	24	2048x8 (450ns)	3.95
27C16	24	2048x8 CMOS	12.95 ~~14.95~~
2716-1	24	2048x8 (350ns)	5.49
27160-5	24	2048x8 (550ns)	3.75
2732	24	4096x8 (450ns)	4.95
2732A-20	24	4096x8 (200ns) 21V	11.49
2732A-25	24	4096x8 (250ns) 21V	7.19
2732A-45	24	4096x8 (450ns) 21V	4.95 ~~6.49~~
27C32	24	4096x8 CMOS	14.95 ~~19.95~~
27C32A-30	24	4096x8 (300ns) 21V (CMOS)	22.95
2764-20	28	8192x8 (200ns) 21V	9.95 ~~14.95~~
2764-25	28	8192x8 (250ns) 21V	7.19
2764-45	28	8192x8 (450ns) 21V	6.49
27C64	28	8192x8 CMOS 21V	14.95 ~~22.95~~
MCM68764	24	8192x8 (450ns) 21V	14.95 ~~24.95~~
27128-25	28	16,384x8 (250ns) 128K 21V	12.95 ~~21.95~~
27256-25	28	32,768x8 (250ns) 256K (14V)	49.95 ~~99.95~~
74S188	16	32x8 PROM O.C. (6330-1)	1.75
74S287	16	256x4 PROM T.S. (6301-1)	1.79
74S288	16	32x8 PROM T.S. (6331-1)	1.79
74S387	16	256x4 PROM O.C. (6300-1)	1.95
74S471	20	256x8 PROM T.S. (6309-1)	4.95
74S472	20	512x8 PROM T.S. (6349-1)	4.95
74S473	20	512x8 PROM O.C. (6348)	4.95
74S474	24	512x8 PROM T.S. (DM87S296N)	4.95
74S475	24	512x8 PROM O.C. (6340)	4.95
74S476	16	1024x4 PROM T.S.	6.95
74S478	24	1024x8 PROM T.S.	9.95
74S570	16	512x4 PROM O.C. (6305)	2.95
74S571	16	512x4 PROM T.S. (6306)	2.95
74S572	18	1024x4 PROM O.C. (6352)	4.95
74S573	18	1024x4 PROM T.S. (82S137)	4.95
82S23	16	32x8 PROM O.C. (27S18)	2.95
82S115	24	512x8 PROM T.S. (27S15)	9.95
82S123	16	32x8 PROM T.S. (27S19)	2.95
82S126	16	256x4 PROM O.C. (27S20)	2.95
82S129	16	256x4 PROM T.S. (27S21)	2.95
82S130	16	512x4 PROM O.C. (27S12)	3.95
82S185	18	2048x4 PROM T.S. (TBP24S81)	9.95
82S191	24	2048x8 (80ns)	14.95
DM87S181N	24	1024x8 PROM T.S. (82S181)	9.95
DM87S184N	18	2048x4 PROM O.C. (82S184)	9.95
DM87S185N	18	2048x4 PROM T.S. (82S185)	9.95
DM87S191N	24	2048x8 PROM T.S. (82S191)	14.95

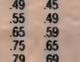
DATA ACQUISITION

Part No.	Pins	Function	Price
DC10		Mostek DC/DC Converter +5V to −9V	2.95
ADC0801	20	8-Bit A/D Converter (1/4LSB)	14.95
ADC0803	20	8-Bit A/D Converter (· 1/2LSB)	4.95
ADC0804	20	8-Bit A/D Converter (1LSB)	3.49
ADC0808	28	8-Bit A/D Conv. w/8-Channel Analog	9.95
ADC0809	28	8-Bit A/D Converter (8-Ch. Multi.)	4.49
ADC0816	40	8-Bit A/D Conv. w/16-Channel Analog	14.95
ADC0817	40	8-Bit A/D Converter (16-Ch. Multi.)	9.49
DAC0806	16	8-Bit D/A Converter (0.78% Lin.)	1.95
DAC0807	16	8-Bit D/A Converter (MC1408-7)	1.49
DAC0808	16	8-Bit D/A Converter (MC1408-8)	2.25
DAC0830	20	8-Bit Up D/A Conv. (.05% Lin.)	5.95
DAC0831	20	8-Bit Up D/A Conv. (.10% Lin.)	4.49
DAC1000	24	10-Bit D/A Conv. Micro. Comp. (0.05%)	7.95
DAC1008	20	10-Bit D/A Conv. Micro. Comp. (0.20%)	6.95
DAC1020	16	10-Bit D/A Conv. (0.05% Lin.)	7.95
DAC1022	16	10-Bit D/A Conv. (0.20% lin.)	5.95
DAC1222	18	12-Bit D/A Conv. (0.20% Lin.)	6.95
DAC1230	20	12-Bit Up D/A Conv. (.05% Lin.)	14.95
DAC1231	20	12-Bit Up D/A Conv. (.10% Lin.)	13.95
AY-5-1013A	**40**	**30K Baud UART (TR1602)**	**3.95**



Low Profile (Tin) Sockets

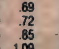
Part No.	1-9	10-99	100-up
8 pin LP	.16	.14	.13
14 pin LP	.17	.15	.14
16 pin LP	.19	.17	.16
18 pin LP	.26	.24	.23
20 pin LP	.30	.27	.25
22 pin LP	.31	.28	.26
24 pin LP	.33	.30	.28
28 pin LP	.40	.37	.35
40 pin LP	.49	.46	.43



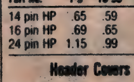
Soldertail (Gold) Standard

Part No.	1-9	10-99	100-up
8 pin SG	.39	.35	.29
14 pin SG	.49	.45	.39
16 pin SG	.55	.49	.45
18 pin SG	.65	.59	.51
20 pin SG	.75	.65	.59
22 pin SG	.79	.69	.65
24 pin SG	.79	.69	.65
28 pin SG	.95	.85	.75
36 pin SG	1.25	1.15	.99
40 pin SG	1.39	1.25	1.15

Wire Wrap Sockets (Gold) Level #3



Part No.	1-9	10-99	100-up
8 pin WW	.55	.49	.45
10 pin WW	.69	.65	.59
14 pin WW	.75	.69	.65
16 pin WW	.79	.72	.65
18 pin WW	.95	.85	.75
20 pin WW	1.19	1.09	.95
22 pin WW	1.29	1.19	1.05
24 pin WW	1.35	1.19	1.09
28 pin WW	1.69	1.55	1.39
36 pin WW	1.89	1.79	1.69
40 pin WW	2.29	1.95	1.79



Header Plugs (Gold)

Part No.	1-9	10-99	100-up
14 pin HP	.65	.59	.55
16 pin HP	.69	.65	.59
24 pin HP	1.15	.99	.89

Header Covers

Part No.	1-9	10-99	100-up
14 pin HC	.15	.13	.12
16 pin HC	.19	.17	.15
24 pin HC	.29	.25	.22

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Part No.	Pins	Function	Price
INS1771-1	40	Single Density	16.95
FD1791	40	Single/Dual Density (Inv.)	24.95
FD1793	40	Single/Double Density (True)	26.95
FD1795	40	Dual Density/Side Select (Inv.)	26.95
FD1797	40	Dual Density/Side Select (True)	29.95
WD2791	40	Single/Double Density (Inv.)	39.95
WD2793	40	Single/Double Density (True)	39.95
WD2797	40	Dual Density/Side Select (True)	39.95

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INTERSIL

Part No.	Pins	Function	Price
7045IPI	28	CMOS Precision Timer	14.95
7045EV/Kit	28	Stopwatch Chip, XTL (Evaluation Kit)	19.95
7106CPL	40	3½ Digit A/D (LCD Drive)	10.49
FE0202D	40	4 Digit LCD Display for 7211IPL & 7211MIPL	14.95
FE0203D	40	3½ Digit LCD Display for 7106 & 7116	14.95
7106EV/Kit	40	IC, Circuit Board, Display (Evaluation Kit)	46.95
7107CPL	40	3½ Digit A/D (LED Drive)	10.95
7107EV/Kit	40	IC, Circuit Board, Display (Evaluation Kit)	46.95
7116CPL	40	3½ Digit A/D LCD Dis. HLD	10.95
7201IUS		Low Battery Volt. Indicator	2.25
7205IPG	24	CMOS LED Stopwatch/Timer	14.95
7205EV/Kit	24	Stopwatch Chip, XTL (Evaluation Kit)	16.95
7206CJPE	16	Tone Generator	4.95
7206CEV/Kit	16	Tone Generator Chip, XTL (Evaluation Kit)	7.95
7207AIPD	14	Oscillator Controller	5.95
7207AEV/Kit	14	Freq. Counter Chip, XTL (Evaluation Kit)	8.49
7211IPL	40	4 Digit LCD Display Decoder/Driver (TTL compatible)	7.95
7211MIPL	40	4 Digit LCD Display Decoder/Driver (Microproc. compat.)	8.95
7215IPG	24	4 Func. CMOS Stopwatch CKT	16.95
7215EV/Kit	24	4 Func. Stopwatch Chip, XTL (Evaluation Kit)	19.49
7216AIJI	28	8 Digit Univ. Counter C.A.	31.49
7216DIPI	28	8 Digit Freq. Counter C.C.	21.49
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7226AEV/Kit	40	5 Function Counter Chip, XTL (Evaluation Kit)	99.95

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74HC High Speed CMOS

Part No.	Pins	Price
74HC00	14	.59
74HC02	14	.59
74HC03	14	.89
74HC04	14	.59
74HCU04	14	.69
74HC08	14	.59
74HC10	14	.59
74HC11	14	.69
74HC14	14	.89
74HC20	14	.59
74HC27	14	.59
74HC30	14	.69
74HC32	14	.79
74HC42	16	1.09
74HC51	14	.89
74HC58	14	.89
74HC73	14	.79
74HC74	14	.79
74HC75	16	.99
74HC76	16	.79
74HC85	16	1.69
74HC86	14	.75
74HC107	14	.79
74HC109	16	.79
74HC112	16	.79
74HC123	16	2.29
74HC125	14	1.75
74HC132	14	1.29
74HC137	16	1.59
74HC138	16	1.19
74HC139	16	1.05
74HC147	16	1.29
74HC151	16	.99
74HC153	16	1.09
74HC154	24	2.65
74HC157	16	.99
74HC158	16	.99
74HC160	16	1.39
74HC161	16	1.39
74HC162	16	1.39
74HC163	16	1.39
74HC164	14	1.35
74HC165	16	2.15
74HC166	16	2.49
74HC173	16	1.29
74HC174	16	1.09
74HC175	16	1.09
74HC190	16	1.59
74HC191	16	1.59
74HC192	16	1.49
74HC193	16	1.49
74HC194	16	1.19
74HC195	16	1.19
74HC221	16	2.95
74HC237	16	1.49
74HC240	20	2.29
74HC241	20	2.29
74HC242	14	2.15
74HC243	14	2.15
74HC244	20	2.29
74HC245	20	2.59
74HC251	16	.99
74HC253	16	1.09
74HC257	16	.99
74HC259	16	1.69
74HC266	14	.89
74HC273	20	2.79
74HC280	14	4.59
74HC299	20	5.59
74HC366	16	2.59
74HC367	16	2.59
74HC373	20	2.69
74HC374	20	2.69
74HC390	16	1.59
74HC393	14	1.59
74HC533	20	2.69
74HC534	20	2.69
74HC595	16	3.19
74HC688	20	3.59
74HC4024	14	1.75
74HC4040	16	1.49
74HC4060	16	1.49
74HC4075	14	.59
74HC4078	14	.59
74HC4511	16	1.95
74HC4514	24	4.19
74HC4538	16	2.59
74HC4543	16	3.75

74HCU04 is unbuffered.
All others are buffered.

74C—C/MOS

Part No.	Pins	Price
74C00	14	.29
74C02	14	.35
74C04	14	.35
74C08	14	.35
74C10	14	.35
74C14	14	.59
74C20	14	.35
74C30	14	.35
74C32	14	.39
74C42	16	1.19
74C48	16	1.79
74C73	14	.69
74C74	14	.59
74C85	16	1.39
74C86	14	.29
74C89	16	5.95
74C90	14	1.09
74C93	14	1.09
74C95	14	1.19
74C107	14	.79
74C151	16	2.19
74C154	24	3.25
74C157	16	1.75
74C160	16	1.19
74C161	16	1.19
74C162	16	1.19
74C163	16	1.19
74C164	14	1.29
74C165	16	1.29
74C173	16	.89
74C174	16	1.19
74C175	16	1.19
74C192	16	1.39
74C193	16	1.39
74C195	16	1.29
74C221	16	1.75
74C240	20	1.95
74C244	20	1.95
74C373	20	2.29
74C374	20	2.29
74C901	14	.59
74C902	14	.79
74C903	14	.59
74C906	14	.59
74C907	14	.89
74C911	28	8.95
74C912	28	8.95
74C915	18	1.19
74C917	28	8.95
74C922	18	4.49
74C923	20	4.95
74C925	16	5.95
74C926	18	5.95
80C95	16	.69
80C97	16	.69

LINEAR

Part No.	Pins	Price
TL071CP	8	.79
TL072CP	8	1.09
TL074CN	14	1.95
TL081CP	8	.59
TL082CP	8	1.19
TL084CN	14	1.95
LM109K		5.95
LM301CN	8	.39
LM302H		2.49
LM304H		1.95
LM305H		.99
LM307CN	8	.49
LM308CN	8	.69
LM309K		1.25
LM310CN	8	1.95
LM311CN	8	.59
LM312H		2.79
LM317T		1.19
LM317K		3.49
LM318CN	8	1.59
LM319N	14	1.49
LM320K-5		1.35
LM320K-12		1.35
LM320K-15		1.35
LM320K-24		1.35
LM320T-5		.85
LM320T-12		.85
LM320T-15		.85
LM320T-24		.85
LM322N	14	1.49
LM323K		4.95
LM324N	14	.59
LM329DZ		.65
LM331N	8	3.95
LM334Z		1.19
LM335Z		1.29
LM336Z		1.09
LM337MP		1.15
LM337T		1.89
LM338K		6.95
LM339N	14	.69
LM340K-5		1.35
LM340K-12		1.35
LM340K-15		1.35
LM340K-24		1.35
LM340T-5		.75
LM340T-12		.75
LM340T-15		.75
LM340T-24		.75
LF347N	14	1.49
LM348N	14	.89
LM350K		4.79
LF351N	8	.59
LF353N	8	.89
LF355N	8	1.09
LF356N	8	1.09
LM358N	8	.59
LM359N	14	1.79
LM370N	14	4.95
LM373N	14	4.95
LM377N	14	1.95
LM380CN	8	1.09
LM380N	14	.89
LM381N	14	1.79
LM382N	14	1.49
LM384N	14	1.95
LM386N-3	8	.89
LM387N	8	1.39
LM389N	18	1.19
LM391N-80	16	1.19
LM392N	8	.59
LM393N	8	.45
LF398N	8	3.95
LM399H		5.95
LF412CN	8	1.95
TL494CN	16	2.79
TL496CP	8	1.59
NE531V	8	1.79
NE544N	14	1.95
NE550A	14	1.95
NE555V	8	.35
XR-L555	8	.69
LM556N	14	.79
NE558N	16	1.59
NE564N	16	1.95
LM565N	14	.99
LM566CN	8	1.49
LM567V	8	.99
NE570N	16	2.95
NE571N	16	2.49
NE592N	14	1.19
LM703CN	8	1.49
LM710N	14	.69
LM711N	14	.79
LM723N	14	.49
LM733N	14	.89
LM739N	14	1.95
LM741CN	8	.39
LM747N	14	.69
LM748N	8	.59
UA760HC		9.95
LM1456V	8	1.95
LM1458CN	8	.59
LM1488N	14	.69
LM1489N	14	.69
LM1496N	14	.99
LM1605CK		9.95
LM1800N	16	2.49
LM1871N	18	2.95
LM1872N	18	3.25
LM1877N-9	14	2.95
LM1889N	18	1.95
LM1896N	14	1.59
LM2002T		1.95
ULN2003A	16	1.49
XR2206	16	3.95
XR2207	14	2.49
XR2208	16	1.79
XR2211	14	2.95
LM2877P		1.95
LM2878P		2.95
LM2901N	14	.79
LM2902N	14	.89
LM2907N	14	2.49
LM2917N	8	1.95
LM3900N	14	.59
LM3905CN	8	1.19
LM3909N	8	.89
LM3914N	18	2.39
LM3915N	18	2.39
LM3916N	18	2.39
RC4136N	14	1.25
RC4151NB	8	1.95
RC4195TK		5.95
LM4250CN	8	1.49
LM4500A	18	2.95
NE5532	8	1.69
NE5534	8	1.39
79M05AH		1.29
ICL8038	14	3.95
LM13080N	8	1.19
LM13600N	16	1.19
76477	28	3.95

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Part No.	Description	Price
JE520CM	For Commodore 64 & VIC-20	$114.95
JE520AP	For Apple II, II+, and *IIe*	$149.95

All Major Manufacturers- Not Micron

Computer Memory Expansion Kits

IBM PC, PC XT and Compatibles

Most of the popular Memory Boards (e.g. Quadram™ Expansion Boards) allow you to add an additional 64K, 128K, 192K or 256K. The IBM64K Kit will populate these boards in 64K byte increments. The Kit is simple to install—just insert the 9 - 64K RAM chips in the provided sockets and set the 2 groups of switches. Complete conversion documentation included.

IBM64K (Nine 200ns 64K RAMs). $33.49

IBM PC AT

Each kit comes complete with nine 128K dynamic RAMs and documentation for conversion.

IBM128K (Nine 250ns 128K RAMs). $199.95

APPLE *IIe*

Extended 80-Column/64K RAM Card. Expands memory by 64K to give 128K when used with programs like VisiCalc™. Fully assembled and tested.

JE864. . . . . $99.95

TRS-80 MODEL I, III

Each Kit comes complete with eight MM5290 (UPD416/4116) 16K Dynamic RAMs and documentation for conversion. Model 1: 16K equipped with Expansion Interface can be expanded to 48K with 2 Kits. Model III: Can be expanded from 16K to 48K using 2 Kits. Each Kit will expand computer by 16K increments.

TRS-16K3	200ns	(Model III)	$6.29
TRS-16K4	250ns	(Model 1)	$5.49

TRS-80 MODEL IV & 4P

Easy to install Kit comes complete with 8 ea. 4164N-20 (200ns) 64K Dynamic RAMs and conversion documentation. Converts TRS-80 Model IV computers from 16K to 64K. Also expands Model 4P from 64K to 128K.

TRS-64K-2. . . . . $29.95

(Converts the Model IV from 16K to 64K or will expand the Model 4P from 64K to 128K)

TRS-64K2PAL (Model IV only). $49.95

(8 - 4164's with PAL Chip to expand from 64K to 128K)

TRS-80 COLOR AND COLOR II

Easy to install Kit comes complete with 8 each 4164N-20 (200ns) 64K Dynamic RAMs and documentation for conversion. Converts TRS-80 Color Computers with D, E, ET, F and NC circuit boards to 32K. Also converts TRS-80 Color Computer II to 64K. Flex DOS or OS-9 required to utilize full 64K RAM on all computers.

TRS-64K-2. . . . . $29.95

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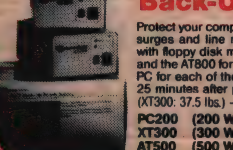
DATASHIELD® Surge Protector

Eliminates voltage spikes and EMI-RFI noise before it can damage your equipment or cause data loss. 6-mo. warranty. Power dissipation (100 microseconds): 2,000,000 watts

PART NO.	DESCRIPTION	PRICE
MODEL 75	4 Sockets, On/Off Switch	$49.95
MODEL 85	6 Sock., Super Filters, On/Off Switch	$59.95
MODEL 100	6 Sock., Super Filters, Low Volt. Alarm	$69.95
MODEL 110AMS	6 Sockets, Super Filters, Auto. Master Switch	$99.95

DATASHIELD® Back-Up Power Source



Protect your computer from black-outs, brown-outs, power surges and line noise. PTI's PC200 is designed for PCs with floppy disk memory, the XT300 for hard disk memory and the AT800 for multi-user systems. A typical compatible PC for each of these standbys will be supported for 15 to 25 minutes after power is lost. Weight (PC200: 24 lbs.) – (XT300: 37.5 lbs.) – (AT500: 83 lbs.) – (AT800: 83 lbs.)

PC200	(200 Watt Rating)	$299.95
XT300	(300 Watt Rating)	$399.95
AT500	(500 Watt Rating)	$699.95
AT800	(800 Watt Rating)	$799.95

ProModem 1200 and Options

PROMETHEUS

Intelligent 300/1200 Baud Telephone Modem with Real Time Clock/Calendar

The ProModem™ is a Bell 212A (300/1200 baud) intelligent stand-alone modem • Full featured expandable modem • Standard features include Auto Answer and Auto Dial, Help Commands, Programmable Intelligent Dialing, Touch Tone™ and Pulse Dialing & More • Hayes command set compatible plus an additional extended command set • Shown w/alphanumeric display option.

Part No.	Description	Price
PM1200	RS-232 Stand Alone Unit	$349.95
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PM1200B	IBM PC and Compatible Internal Unit	$269.95
PM1200BS	IBM PC & Comp. Int. Unit w/ProCom Software	$319.95
MAC PAC	Macintosh Package. (Includes PM1200, Cable, & ProCom Software)	$399.95

OPTIONS FOR ProModem 1200

PM-COM	(ProCom Communication Software). Please specify Operating System.	$79.95
PM-OP	(Options Processor)	$79.95
PMO-16K	(Options Processor Memory – 16K)	$10.95
PMO-32K	(Options Processor Memory – 32K)	$20.95
PMO-64K	(Options Processor Memory – 64K)	$39.95
PM-ALP	(Alphanumeric Display)	$79.95
PM-Special	(Includes Options Processor, 64K Memory and Alphanumeric Display)	**$189.95**

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Mitsumi 54-Key Unencoded All-Purpose Keyboard

• SPST keyswitches • 20 pin ribbon cable connection • Low profile keys • Features: cursor controls, control, caps (lock), function, enter and shift keys • Color (keycaps): grey • Wt.: 1 lb. • Pinout included

KB54. . . . . $14.95

New!

82-Key ASCII Cherry Keyboard

• 7-bit parallel ASCII • 11-key numeric keypad • Cursor keypad • SPST mechanical keyswitches • 4 illuminated keys • 26-pin header connector Color: white • Size: 18"L x 6¼"W x 1¼"H • Spec included

KB8201. . . . *(1700 avail.)*. . . . $29.95

Apple Owners!
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Apple Keyboard and Case for Apple II and II+

Keyboard: • 68 keys • 15-key keypad • Direct connection with 16-pin ribbon connector • 26 special functions • Size: 14½"L x 5½"W x 1½"H

Case: Accommodates KB-A68 • Pop-up lid for easy access • Fits power supply and motherboard too • Size: 15½"W x 18"D x 4¼"H

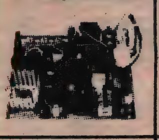
Part No.	Description	Price
KB-EA1	Apple Keyboard and Case (pictured above)	$134.95
KB-A68	68-Key Apple Keyboard only	$ 79.95
EAEC-1	Expanded Apple Enclosure Case only	$ 59.95

POWER SUPPLIES

Power/Mate Corp. REGULATED POWER SUPPLY

• Input: 105-125/210-250 VAC at 47-63 Hz • Line regulation: ±0.05% • Three mounting surfaces • Overvoltage protection • UL recognized • CSA certified

Part No.	Output	Size	Weight	Price
EMA5/6B	5V@3A/6V@2.5A	4⅞"L x 4"W x 2⅛"H	2 lbs.	$29.95
EMA5/6C	5V@6A/6V@5A	5⅝"L x 4⅞"W x 2⅞"H	4 lbs.	$39.95



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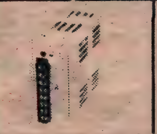
• Ideal for disk drive needs of CRT terminals, microcomputers and video games • Input: 115/230VAC, 50/60Hz • Output: +5V @ 5 Amp, +12V @ 1.8 Amp, +12V @ 2 Amp, -12V @ 0.5 Amp • UL recognized • CSA certified • Size: 7⅜"L x 6-3/16"W x 1⅝"H • Weight: 2 lbs. **$59.95 each or**

MRM 174KF. . . . . 2 for $99.95

Switching Power Supply for APPLE II, II+ & *IIe*™

- Can drive four floppy disk drives and up to eight expansion cards
- Short circuit and overload protection • Fits inside Apple computer
- Fully regulated +5V @ 5A, +12V @ 1.5A, -5V @ .5A. -12V @ .5A
- Direct plug-in power cord included • Size: 9⅞"L x 3½"W x 2¼"H
- Weight: 2 lbs.

KHP4007 (SPS-109). $59.95



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• Microprocessor, mini-computer, terminal, medical equipment and process control applications • Input: 90-130VAC, 47-440Hz • Output: +5VDC @ 5A, -5VDC @ 1 A; +12VDC @ 1A, -12VDC @ 1A • Line regulations: ±0.2% • Ripple: 30mV p-p • Load regulation: ±1% • Overcurrent protection • Adj: 5V main output ±10% • Size: 6⅜"L x 1⅞"W x 4-15/16"H • Weight: 1½ lbs.

FCS-604A. $69.95

New!

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UPGRADE YOUR PC!

• Input: 100V-130V/200V-260V selectable @ 47 to 63Hz • Output: +5VDC @ 15A, –5VDC @ 0.5A, +12VDC @ 4.2A, –12VDC @ 0.5A • Plug compatible connectors • Fits into IBM PC • Weight: 6 lbs.

IBM-PS. $169.95

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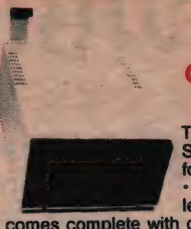
Apple Accessories



5¼" APPLE™ Direct Plug-In Compatible Disk Drive and Controller Card

The ADD-514 Disk Drive uses Shugart SA390 mechanics—143K formatted storage • 35 tracks • Compatible with Apple Controller & ACC-1 Controller • The drive comes complete with connector and cable — just plug into your disk controller card • Size: 6"L x 3½"W x 8-9/16"D • Weight: 4½ lbs.

ADD-514 (Disk Drive)	$169.95
ACC-1 (Controller Card)	$ 49.95

More Apple Compatible Add-Ons...

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KHP4007	(Switching Power Supply)	$59.95
JE614	(Numeric/Aux. Keypad for *IIe*)	$59.95
KB-A68	(Keyboard w/Keypad for II & II+)	$79.95
MON-12G	(12" Green Monitor w/swivel stand)	$99.95
JE864	(80 Col. +64K RAM for *IIe*)	$99.95
ADD-12	(5¼" Half-Height Disk Drive)	$179.95

NEW!

ADDITIONAL APPLE™ ADD-ONS AVAILABLE

ARC-16K	(16K RAM Card for Apple II & II+)	$39.95
AEB-2	(EPROM Burner for Apple II, II+ & *IIe*) Allows copy of standard EPROMS 2708, 2716, 2732, 2764	$69.95
ASSC-P	(Super Serial Card for Apple II, II+ & *IIe*)	$99.95
ADD-IIc	(5¼" Half-Ht. Disk Drive for Apple *IIc*)	$189.95

DISK DRIVES

Documentation Included
Best Buys!

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FD55B	(Teac 5¼" DS half-ht.)	$149.95
SA455	(Shugart 5¼" DS half-ht.)	$159.95
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UV-EPROM Eraser

8 Chips - 21 Minutes
1 Chip - 15 Minutes

Erases all EPROMs. Erases up to 8 chips within 21 minutes (1 chip in 15 minutes). Maintains constant exposure distance of one inch. Special conductive foam liner eliminates static build-up. Built-in safety lock to prevent UV exposure. Compact — only 9.00"L x 3.70"W x 2.60"H. Complete with holding tray for 8 chips.

DE-4	UV-EPROM Eraser	$74.95
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See Our New IBM Communications Program!

24 & 28 PIN PACKAGES
8K to 64K EPROMs

REQUIRES NO ADDITIONAL SYSTEMS FOR OPERATION

Programs and validates EPROMs • Checks for properly erased EPROMs • Emulates PROMs or EPROMs • Loads data in RAM by keyboard • Changes data in RAM by keyboard • Loads RAM from an EPROM • 664 RAMs can be used for external microprocessor development • Compares EPROMs for content differences • Copies EPROMs • Input: 115VAC @ 60Hz • Assembled and tested • Size: 15⅝"L x 8¾"D x 3½"H • Wt: 5¾ lbs • **2716 Module included**

JE664-A EPROM Programmer. $995.00

JE665-RS232C INTERFACE OPTION — This option implements computer access to the JE664's RAM, allowing computer to manipulate, store, and transfer EPROM data to and from the JE664. Sample program listing is supplied in MBASIC for CP/M computers • Documentation provided to adapt the software to other computers with an RS232 port • Specs: 9600 Baud, 8-bit word, odd parity with 2 stop bits • Assembled and tested • **2716 Module included**

JE664-ARS EPROM Programmer w/JE665 Option. $1195.00

JE664-ARS COMMUNICATION PROGRAM For IBM-PC or XT and Compatibles

• Fast compiled BASIC program • Easy to use, menu-driven • Print hard-copies of EPROM data • View data in HEX and ASCII **NEW!**

The JE664-ARS Communication Program was written for quick interfacing between the JE664-ARS EPROM Programmer and the IBM-PC computer and compatibles. Menu-driven program allows user to Load and Save EPROM data to and from the computer or floppy disk. Data entered by the computer can be viewed in Hex & ASCII formats. Printed hard-copies are also displayed in both formats. Program is ideal for keeping archives of master EPROMs on disk. The program is compatible for all EPROMs listed with the JE664. Computer requirements: IBM-PC, XT (or eq.) with at least 128K RAM and one serial port. Optional: One parallel port for printer.

JE664-ARS-CP. $49.95
JE664-ARS Communications Program (5¼" Disk and User's Instructions)

JE664-CP CABLE. $29.95
Cable for IBM-PC to JE664-ARS Program (5' Shielded Cable Assembly)

JUMPER (Personality) MODULES — Jumper (Personality) Modules for 8K, 16K, 32K, and 64K EPROMs. *Please specify EPROM and manufacturer.

JUMPER (Personality) MODULE *________ . . . . **$14.95 each**

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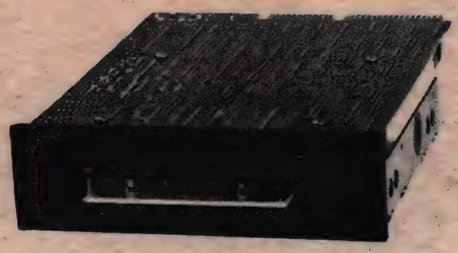

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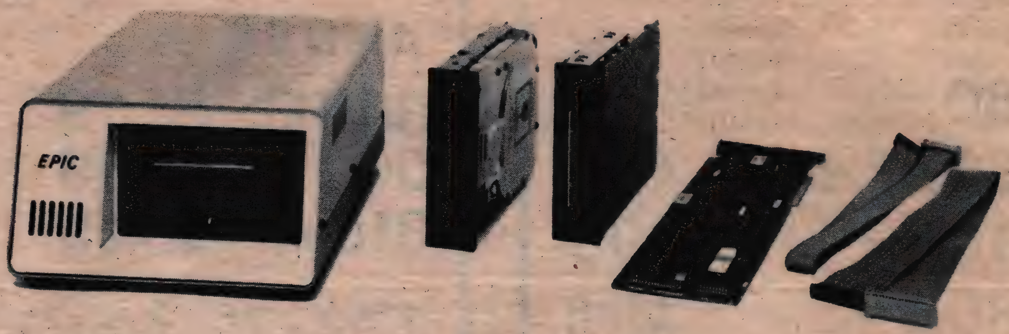

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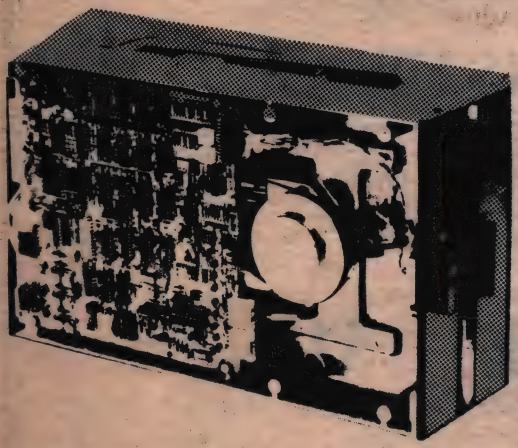

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MacUniverse

by L.J. Kutten

Your Universe Master has been saved. True word processing has finally come to the Macintosh! I am talking about Microsoft WORD. WORD has every feature I could want and then some. If you are familiar with full feature word processing programs on other computers, such as Wordstar, Multimate, or SuperScripsit, you will not be disappointed. I think WORD beats them all. I have only had WORD for two weeks, so what follows are some initial observations. A detailed review will follow within two months.

WORD has a number of advantages over MacWrite. First, WORD has true windowing. You can have four documents opened at once. Just click the mouse on the shadowed document and it comes to the forefront. You can even copy and paste between documents.

If you do scholarly writing, you will love WORD's footnote tracking ability. You can place footnotes on the same page on which the footnote appears or at the end of the documents. If you insert a new footnote between two pre-existing notes or move the location, WORD will automatically renumber them.

WORD allows a margin to be set wherever you want as compared to MacWrite's minimum one inch left margin and eight inch right margin. With WORD, you can have a zero inch left margin and the screen even shows a twenty inch right margin! WORD has a massive on-line help file and many of the mouse commands have keyboard equivalents. Finally WORD has two new fonts, Dover and Dover PS.

Unfortunately, all is not golden with WORD. First, the program is not cheap. At $195 this is not a program to buy on the spur of the moment. Secondly, the program is very big. While you can use WORD on a 128K one drive Mac, I do not recommend it. You really need a second disk drive to store files; otherwise, you will constantly be swapping disks. On my 128K Mac, I cannot call the desktop without getting a systems error. WORD is slower than MacWrite by a factor of at least 1.5 to 1. Headers and footers are complicated to set (for some reason mine seem to be resetting themselves at times) and they do not include the date or time functions found in MacWrite.

If you do buy WORD, make sure your version is dated January 22, 1985 or later. I have heard there are problems with the version dated in December, 1984. Finally, when you get WORD take a close look at the cover. Mine shows two people supposedly using WORD on a Mac. But a close inspection of the picture reveals whatever program they are using, it is not WORD.

If WORD is not what you want, here are statistics on the new MacWrite. It will allow 500 paragraphs on a 128K Mac and 2000 on a 512K. A paragraph is defined as a ruler, a picture, a page break, or text which is followed by a ruler, a picture, a page break, or a return. Maximum document size is 255 pages.

Last month I told you about Lotus' Jazz. Now I want to tell you about a poor man's Jazz, ENSEMBLE. ENSEMBLE was created by Hayden Software and costs only $299.95. ENSEMBLE is an integrated program that combines data base management, report and form generation capabilities, word processing, spreadsheet, business graphics, and the ability to link multiple files. It even has compatibility with MacPaint and MacWrite files.

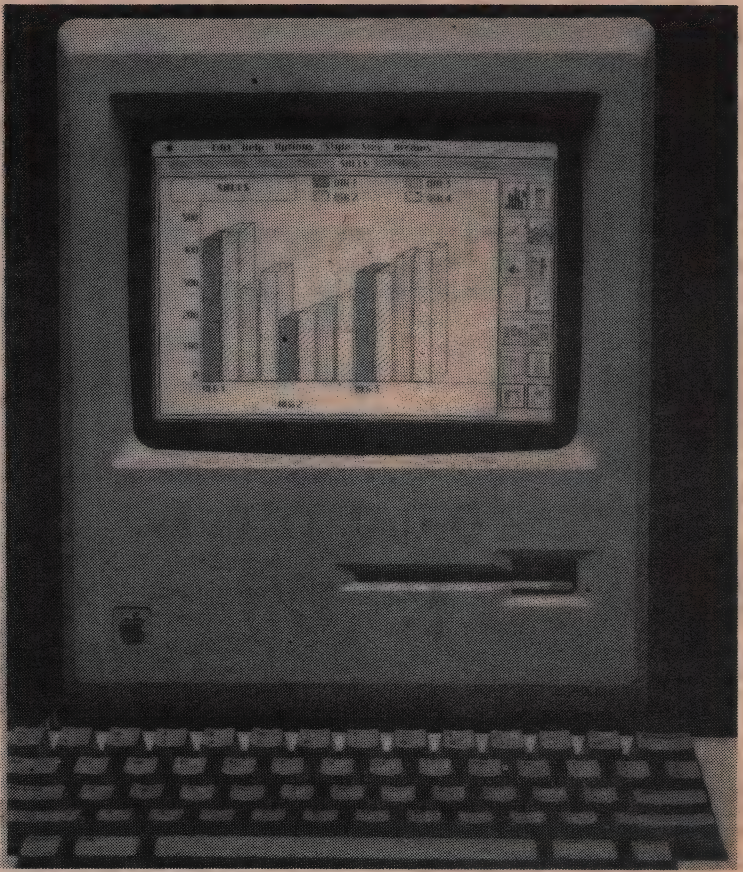
ENSEMBLE is very Maclike and uses the standard Macintosh tools: pull-down menus, icons, windows, and dialog boxes. It will work on a 128K one drive Mac (I tested it!) but it is very slow. With only one drive, it can hold a very limited amount of data and be prepared to do a lot of disk swappings. Also, you will need an Imagewriter in order to print out information.

For those trivia enthusiasts out there, take a look at Trivia Fever. This game is playable by up to eight people (or teams). It has three difficulty levels, time control (the game can last from 15 minutes to all evening), and even allows handicapping.

If you are interested in database programs, I have heard nothing but good things about MacLion, DB Master, and Odesta Helix. Look for a review on them in the near future. For now if you have DB Master and your serial number is below 4318 return it for a new copy. You have a bug in the soft capabilities. Also, Helix has the strangest bug I have heard of to date. It appears that at one place, if you do something wrong, the program tells you so, using a certain four letter word that cannot be printed here. Also, if you are waiting for Hayden Base, do not. I have it on good authority the program has been cancelled (ENSEMBLE is replacing it).

I heard a rumor from a reliable source that Apple will soon have a program out called SWITCHER. If you have a Fat Mac, you will be able to have three programs in memory at one time and switch back and forth between them. Best of all, according to this rumor, is that the program will be free! (I will believe it when I see it.)

Microsoft has announced a hardware add-on for the Mac called the expander. Plug it into either your printer or modem port and it allows you to add other peripherals to the Mac. Included are a DB 9 port, a parallel port, two serial ports, and two disks of software printer drivers that will allow almost any printer made to work with the Mac. From its description, this looks like an interesting peripheral. Maybe Microsoft is trying to turn the Mac into a hacker's machine! You can be sure I will keep you advised on this "development."



The Fat Mac

This month I have two books to recommend. The first is "Inc. Magazine's Databasics"

Continued on page 66

Does The Mac Mean Business?

by Barbara E. & John F. McMullen

What is the future of the Apple Macintosh in the large business community? Is it, as many suspect, a "solution looking for a problem," a technically superior machine that will fail in the Fortune 1000 community because, in achieving technical superiority, Apple severely underrated the importance of IBM compatibility? Or is it, as Apple fervently prays, a machine so far ahead of its time that software providers and business users are just beginning to catch up with the technology and realize the unlimited potential of the machine?

While it is safe to say that the jury is still out on these issues (and will be for a while, at least until we can begin to ascertain the impact on the marketplace of the soon to be distributed Lotus "Jazz"), we felt that we could add some clarity to this mystery by talking to a few microcomputer managers in large corporations (those people charged with the responsibility of selecting microcomputers for their organizations) to obtain their perspective on the impending degree of success of the Mac in the corporate community.

Michael Hudak is a Macintosh owner and user. He is also Director of Research for ABC Owned Television Stations and the person directly responsible for the selection of microcomputers for the various stations. Although only IBM-PCs are purchased and supported throughout the organization, Hudak notes that Macs are starting to appear in various departments throughout ABC. These Macs are being used primarily in areas that require graphics to, in Hudak's words, "make numbers palatable." Hudak himself has used the Mac and "FileVision" to prepare displays of ABC's Nielson performance in the New York metropolitan area for marketing presentations. He has also used "ThunderScan" to read printed advertising art work into the Mac which he then modified with "MacPaint". Based on these experiences, Hudak believes that the Mac will carve out a niche in large corporations. He does not, however, feel that this success will be to the detriment of IBM. "IBM-PCs will unify the numerical areas; Macs will

Continued on page 64

Mac Hints

by Philip Chien

Apple Computer's Macintosh has been out a little over a year now, and, as users are getting used to the Mac's hardware and software, shortcuts and new "features" are being developed. The following are simple hints and suggestions which will help you use your Mac a little more efficiently.

Cord Extension

One common problem using the Macintosh is desk space. One reason to purchase the Mac is to clean up the clutter, while it usually succeeds in cleaning up the user's desk. Mac usually creates its own clutter. One obvious solution is to put the printer off on its own desk with a paper supply and printout catcher. Unfortunately, the 6 foot printer cable which comes with the Mac just isn't long enough. The solution is simple. Radio Shack and many video stores sell Joystick expention cables, designed to work with Joysticks for Atari video games. Fortunately, these cables use the same DB9 connector used on the Macintosh. A 10 foot cord from Radio Shack (P/N 276-1978) will cost you only $3.99. Just plug the cord between the Mac and your present printer cable.

Mac - Superscripts and Subscripts

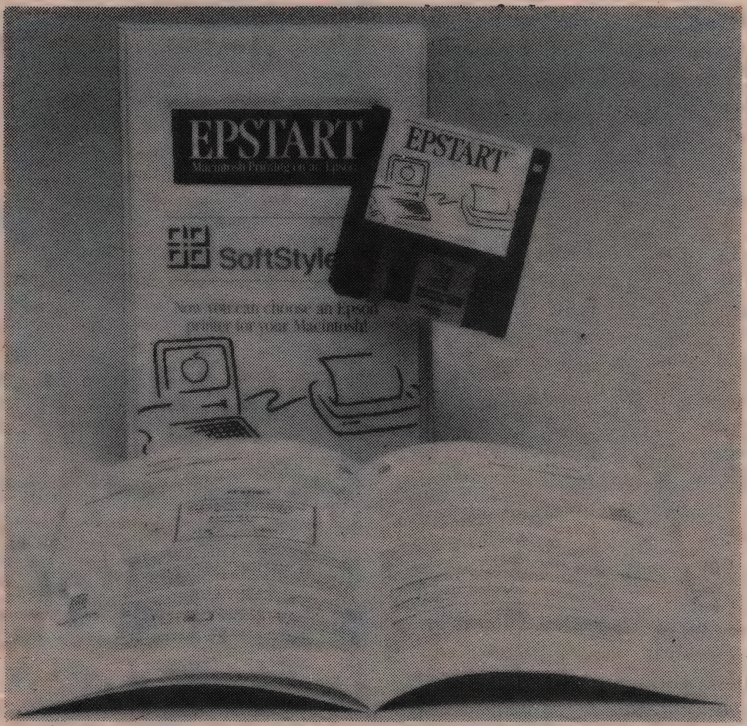
One very simple feature in MacWrite is overlooked or forgotten by most people - subscripts and superscripts. Simply change character size and type in the ascender or descender as needed.

Imagewriter - Speed

Another common MacWrite problem is printout speed. Although the Imagewriter normally prints an entire page in less than a minute, sometimes it seems that MacWrite takes a minute to print each line! The reason is simple. When the Mac normally prints, it uses the Imagewriter's graphics mode, which severely limits the speed of the Imagewriter. In addition, much more data has to be transmitted than normal. The simple solution is to use MacWrite's "Draft" (text only) mode. In that mode, characters are sent directly to the printer, without translation into the Mac's character fonts. I always use the Draft mode on my Mac for any printout, unless I am sending out a "final finished copy" in which case I use the standard Macfonts mode. Naturally special text (e.g. different size characters, proportional fonts, bold titles, etc.) will not be available, but the speed difference makes it worth it.

Continued on page 67

New Epstart Version 2.0 Supports More Epson Printers on Apple Macintosh



SoftStyle, Inc. (Honolulu) now offers a new version of the printer control utility that lets Epson printers work with the Apple Macintosh. In addition to FX- and JX-series (and compatible) printers, this new version supports Epson MX-, RX-LX-, and LQ-series printers: it also lets users select single color printing on the JX-80 color printer and letter-quality printing on the LQ-1500. Epstart Version 2.0 is available for $45.00 at participating SoftStyle dealers.

Epstart Version 2.0 will produce text and graphics from all applications that follow Macintosh printing standards, including MacPaint, MacWrite, MultiPlan, Microsoft BASIC and more. It produces draft printing as quickly as the Imagewriter, and with improved column alignment and better word collision prevention. It also provides standard and high-quality graphics printing, screen printing and wide (sideways) printing. In addition, the Epson printer may be connected to either the Macintosh printer or modem ports. Variable port speeds are supported to allow a variety of serial interfaces.

Single-color and letter quality are now available through a Print Adjustment Accessory, included with Epstart. This also lets a user add extra density to Macintosh high-quality printing, and provides access to special features available on some Epson printers.

Epstart Version 2.0 no longer needs to be copied to each application disk. An application disk is easily modified. From then on, the application runs normally. Epstart is transparent to the user and is easily reversible.

For further information, contact SoftStyle, Inc., 7192 Kalanianaole Highway, Suite 205, Honolulu, HI, 96825, (808)-396-6368.

Mention that you read about it in the **Computer Shopper.**

Software Review: Hayden: Speller

by L.J. Kutten

Can u spel? Eye kant. That is y eye m hapi two hav Hayden: Speller. Using it has improved my spelling. Hayden: Speller is a full featured spelling dictionary for use with either MacWrite or Microsoft Word. It will compare your words against its 20,000 main word dictionary and any specified user created specialized dictionaries. It differs from many spelling dictionaries in that it allows you to correct misspelled words in place rather than merely marking them for later editing with a word processor.

Using Hayden: Speller is an exercise in simplicity. Double click on the dictionary icon and the Hayden: Speller menu bar appears at the top of the screen. Then using the mouse or the keys [command] O, will cause Hayden: Speller to display a list of documents it finds. Click on the file to select it and then click on open message. Hayden: Speller will then spell check the document. It will tell you the number of total words, the number of different words, the number of valid words, and the number of suspect words. From here you can proof the file. If you want you can first review the suspect or valid words, Hayden: Speller will print them out on the screen or on your printer. If you do not want to review them, you can immediately go to "Check Words" under the Correct menu (or use [command] W). Hayden: Speller will then display each suspect word individualy and give you the chance to make corrections.

Continued on page 72

Desk Accessories — A Wide Variety

by L.J. Kutten

The Macintosh comes with a number of desk accessories that are theoretically callable from any program. The standard desk accessories include the calculator, notepad, scrapbook, control panel, alarm clock, key caps, and puzzle. While they are nice, they are not always needed nor wanted. How many times can you play with the puzzle or set the control panel? Even worse is that they take up precious desk space. Luckily they are not required for operation.

Using a program, the Desk Accessory Mover from CE Software you can delete them and add new ones. Desk Accessory Mover is to desk accessories what the font mover is to fonts. Many different desk accessories are available free or through shareware (i.e. you get to try it free, if you like it you pay for it). What follows is an explanation of the useful desk accessories found in Compuserve's Apple SIG (page PCS-51). All of them are found in either Data Library 3 or 4.

To get these accessories, download them using MacTerminal, MacTEP, RLMTEP, or any other Mac communication program (but not Dow Jones Straight Talk). Next, use BINHEX Version 4.0 to convert them. Once converted, the Desk Accessory Mover can utilize them.

My favorite desk accessory is EJRSDA.HCX. It willl eject both disks and reset the Mac. This is useful if you want to remove the startup disk in order to start another application. Before I started using it, I would have to swap the disks or manually use the reset switch on the Mac's right side. The only danger with this accessory is that all opened files should be closed before using it. Otherwise, the data in the opened files may be lost. This accessory is free.

My second favorite desk accessory is IDLE.HCX. When you call it, the Mac's screen goes dark and little white Mac appears at random places on the screen. The dark screen replaces whatever is presently on the screen. If you move the mouse a white arrow will momentarily appear. Click the mouse and your original screen reappears. The documentation for this desk accessory is in the

Continued on page 70

Apple IIc Printer Interfacing

by Fred Blechman

If you have an Apple IIc and want to use a non-Apple printer with it, you'll be faced with some challenges. Although the Apple IIc has two sockets (called "ports") that can support a printer, no information is supplied with the IIc on the signals and wiring involved to connect a "foreign" printer. There is also no alternative described to the awkward and confining use of the System Utilities Disk to set these ports.

This article will solve the Port # 1/Port # 2 mysteries and describe how to use most printers with either port. Part 1 covers serial interfacing and port configuration; Part 2 describes parallel interfacing.

Interfacing

You don't just lay a printer alongside a computer and expect osmosis to transmit the signals. The computer and the printer must be cabled together in a manner compatible to both. This is called "interfacing".

The two commonly used interfaces between microcomputers and printers are the RS-232C serial interface and the "Centronics-compatible" parallel interface.

Serial interfacing has the advantage of relatively few wires between units, and the capability to have the units between 50 and 100 feet apart without signal contamination. Parallel interfacing requires more wires, and is generally limited to short distances - up to about 10 feet - between mating units, to avoid signal corruption.

Apple IIc Serial Ports

The Apple IIc does not offer a parallel interface, but has two serial ports. Port # 1 is normally used for printers, and Port # 2 for communications, but this article will show you how to modify these ports to your own requirements.

Serial interfacing, using the RS-232C standard, is the subject of several entire books, so I won't attempt to cover that information here. If you are familiar with the technology, Fig. 1 shows the pinouts for both ports on the Apple IIc. While the pinouts are the same, the default settings on boot-up are not, however, and they are shown in Table 1. The port configurations can be changed, and we'll get to that shortly.

If you are unfamiliar with some of the following terminology, find a fellow computerist who is familiar with the RS-232 standard, and you'll find it easy to make the changes described.

Printer Choices

If you want the fewest problems in using a printer with the Apple IIc, use only Apple printers - the Scribe (A2P4042 - only $299, but a voracious ribbon-user) or the Imagewriter (A2P4025 - expensive at $595.) They have been designed to interface directly with Port # 1 of the Apple IIc, using the port default settings.

However, if you already have a printer, or choose to buy a non-Apple printer, you have several choices:

(1) If the printer has a serial interface, simply configure it to conform to the Port # 1 defaults. This is usually done by setting the appropriate printer switches.

(2) If the printer interface is serial, but cannot operate with the Apple IIc port default settings, change the port "configuration." This can be done with software or from the keyboard, as described further on.

(3) If the printer has a so-called "Centronics-standard" parallel interface, you may be able to use one of several serial-to-parallel converters described in Part 2 of this article.

Configuring The Ports

If you are using a non-Apple serial printer, and it won't operate at the default (boot-up) settings of Port # 1 or Port # 2, you can still interface it to the Apple IIc.

System Utilities Disk

The System Utilities disk included with the Apple IIc provides a means for changing the various settings of Port # 1 or Port # 2. After initially booting up this disk (which takes about 40 seconds!), you go through a series of confusing menu selections to configure the selected port. These selections are then saved on the disk, so the next time you boot-up with this disk the defaults have become your

Continued on page 96

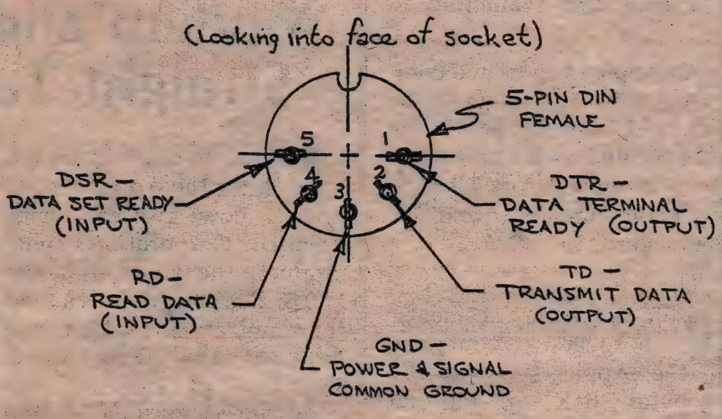

(Looking into face of socket)
5-PIN DIN FEMALE
5
1
4
3
2
DSR — DATA SET READY (INPUT)
DTR — DATA TERMINAL READY (OUTPUT)
RD — READ DATA (INPUT)
TD — TRANSMIT DATA (OUTPUT)
GND — POWER & SIGNAL COMMON GROUND

Fig. 1 Serial Port Connector
(Same pinout for Port #1 & Port #2)

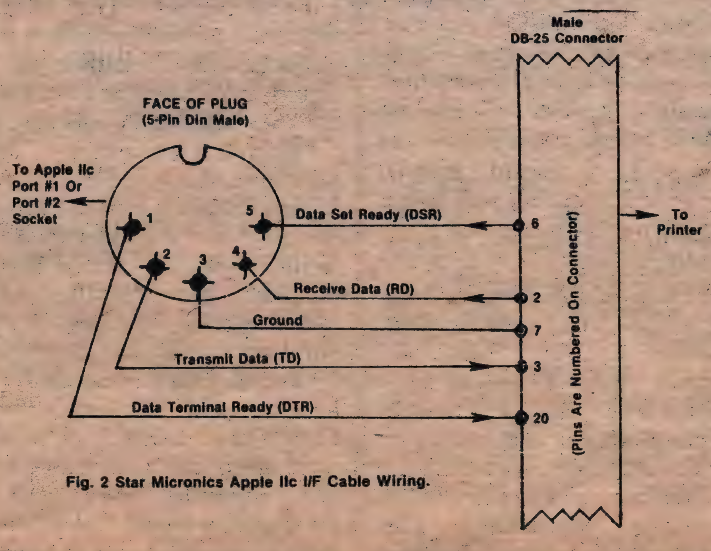

Male DB-25 Connector
FACE OF PLUG (5-Pin Din Male)
To Apple IIc Port #1 Or Port #2 Socket
1
2
3
4
5
Data Set Ready (DSR)
Receive Data (RD)
Ground
Transmit Data (TD)
Data Terminal Ready (DTR)
6
2
7
3
20
(Pins Are Numbered On Connector)
To Printer

Fig. 2 Star Micronics Apple IIc I/F Cable Wiring.

TABLE 1
PORT DEFAULT SETTINGS

Description	Port #1 Default	Port #2 Default
Word Length	8 Bits	8 Bits
Stop Bits	Two	One
Parity	None	None
Baud Rate	9600	300
Screen Echo	No	No
LF/CR	Yes	No
Characters Per Line	80	No Carriage Return
Command Charact.	I	A

TABLE 2
SOME PORT #1 CONTROL COMMANDS

Command	Key	Effect
BAUD RATE	B	1B - 50 Baud 9B - 1800 Baud 2B - 75 Baud 10B - 2400 Baud 3B - 110 Baud 11B - 3600 Baud 4B - 135 Baud 12B - 4800 Baud 5B - 150 Baud 13B - 7200 Baud 6B - 300 Baud 14B - 9600 Baud 7B - 600 Baud 15B - 19200 Baud 8B - 1200 Baud
WORD LENGTH & STOP BITS	D	0D-8 Data 1 Stop 4D-8 Data 2 Stop 1D-7 Data 1 Stop 5D-7 Data 2 Stop 2D-6 Data 1 Stop 6D-6 Data 2 Stop 3D-5 Data 1 Stop 7D-5 Data 2 Stop
Echo	I	Output Also To Screen
Line Feed	K	Disable After Carriage Return
Line Feed	L	Generate After Carriage Return
Line Width	N	Number N = Line Width (1-255)
PARITY	P	0P - None 4P - None 1P - Odd 5P - Mark (=1) 2P - None 6P - None 3P - Even 7P - Space (=0)
Default	R	Reset To Default And Exit

NOTE: Access Port First With PR#1, Then Use Control I Before Each Command. PR#0 Will Return You To Screen-Only, But All Settings Will Return To Default Settings.

Ask The Guru

by Don Lancaster

Opening a Macintosh, multiple headers for Applewriter, curing a nasty Diablo 630 bug, rearranging the spokes on a daisywheel, a brand new book, tough integrated circuit drive, fundamentals of motors, and the "forced return" method of option picking.

Here we go on version 3.0 of our new *Computer Shopper* feature column. As usual, I'll do what I can here to find answers to reader hardware, software, or supply problems. Just give me a call or write per the address in the end box. Best calling times are 8-5 weekdays, mountain standard time. I'll send a free booklist and a special goodies list to you when you respond. And even more stuff if you are an Apple hacker.

While I will try to fairly cover all of the bases, don't expect unbiased miracles from someone whose vehicle license plate numbers are 6502 and 65C02. I'll call things as I see them.

Again as usual, will gather all of the names and numbers together in a box at the end. Note that some of these sources are *very* hard to pin down elsewhere, so be sure to save these listings.

Thanks to your response so far, I've had to buy a power letter opener. While the twin Allison diesel engines on it sure are impressive, the noise and fumes get kind of excessive at times. Looks like a skip loader will be needed to fill the hopper, since snow shovels take far too long. Anyway, keep writing.

Well, here's warm the boot on V3.0...

How Do I Open The Case On a Macintosh?

There are four screws with funny heads on them that hold the Macintosh case together. Two of these screws are buried deep in a pair of access holes.

These are #10 TORX screwheads. This is the same screw used on many cars for such things as mounting lights and trim. Unfortunately, a stock #10 TORX screwdriver will not reach two of the screws, since its shaft is an inch too short.

You can go out and buy an *Xcellite* #XTD-10 Torx screwdriver from *Jensen Tools, Techni-Tool,* or most any larger electronics distributor. This one will work fine.

But, there is a sneakier and easier way.

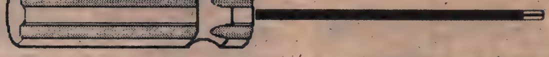
Go to your local discount auto parts store (from *Checker Auto, Yellow Front,* whatever...) and buy the cheapest #10 *Torx* driver you can find. Usually there will only be two sizes available. You want the smaller of these.

Then, grind, cut, file, melt, stomp, or otherwise molest the handle down to the shape shown in figure one. The cut-down part of the handle should be 7/16" or less in diameter, and you need about an inch and a half removed.

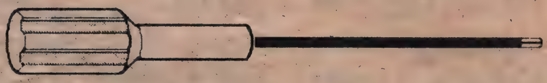
The modified driver should reach the two buried screws.

By the way, if you are a

Continued on page 178



(A) Stock #10 TORX screwdriver from discount auto store.



(B) Handle modified to give longer reach for Mac access.

Figure one - A special long reach TORX screwdriver is needed to open a Macintosh. Here's how to fake one

Apple Introduces New Apple IIe

Apple Computer has introduced an enhanced version of its Apple IIe personal computer that provides new hardware features while retaining its expandability and color-capability, as well as compatibility with nearly all of the more than 10,000 software programs currently available for IIe. The hardware enhancements also are available to the Apple IIe installed base in a IIe Enhancement Kit available through authorized Apple dealers.

The Iie enhancements are achieved through the replacement of four chips on the AppleIIe's main logic board:

A 65C02 microprocessor, the same processor in the Apple IIc personal computer, is now in the Apple IIe. The new processor provides complete compatibility between the Apple IIe and IIc, as well as additional programming instructions that allow developers to write more efficient software and to reduce their development time.

The character generator ROM chip that is in the Apple IIc is now in the Apple IIe. This chip adds support of Apple's MouseText character set, which allows developers to produce more sophisticated, easier to use software for the IIe and IIc that support pull-down menus, windows, and graphic icons.

Two revised monitor ROM chips improve the IIe's mouse response and network support, as well as provide developers the capability to incorporate print spooling and colock support in their programs. In addition, the monitor ROMs simplify programming since they provide a built-in mini-assembler and the ability to enter BASIC commands in upper and lower case.

"The enhancements to the Apple IIe demonstrate our commitment to the Apple II family of personal computers," said Del Yocam, vice president and general manager of the Apple II division. "We have built new technology into the IIe that extends its capabilities and versatility, while retaining the basic Apple II design that has allowed us to sell more than two million Apple II's over the last eight years. In addition, not only are we allowing new IIe users to benefit from this new technology, but we also are providing an upgrade path for our huge installed base to take advantage of these enhancements."

Based on its compatibility test results of over 750 programs, Apple reports that over 95% of Apple IIe software currently available on the market will run on the enhanced IIe. The few Apple IIe programs that are incompatible are mostly older versions of products, the majority of which have been revised and are compatible with the enhanced IIe. Free or inexpensive upgrade programs are available for nearly all of these products that allow owners of the older versions to upgrade to the new compatible versions.

In addition to the new chips, the enhanced Apple IIe comes with a revised Owner's Manual and "The Inside Story," an interactive tutorial program not before included with the IIe that explains the fundamentals of how a computer works.

With the introductions of the enhanced IIe, Apple also has phased in new IIe packaging and dealer merchandising materials that better highlight the product's key features.

Pricing and Availability

All Apple IIe personal computers now shipping in the U.S. and Canada contain the enhancements; the enhanced IIe is available from all U.S. and Canadian authorized Apple dealers.

There is no price change as a result of the enhancements. The U.S. suggested retail price of the Apple IIe with 64 kilobytes (64K) of internal memory remains at $895. In addition, the Apple IIe Professional System, which includes a 64K Apple IIe, a display monitor, two disk drives and an extended 80-column card that expands the IIe's internal memory to 128K, still sells in the U.S. for +1,795.

The IIe Enhancement Kit that allows the IIe installed base to upgrade their systems to include the four new chips also in available now from all U.S. and Canadian authorized Apple dealers. The IIe Enhancement Kit's U.S. suggested retail price is $70, which includes dealer installation.

Localized international versions of the enhanced Apple IIe and IIe Enhancement Kit will be available worldwide later this year.

Modem and Dow Jones Straight Talk For Mac

A complete communication solution for the Apple Macintosh is now available with Prentice Corporation's new product, the Popcom model M125. The new M125 is a total communications package that includes the Dow Jones Straight Talk software, the Prentice Popcom modem, the cable for connecting the modem to the Macintosh, and the telephone line cable. The Popcom model M125 was available in computer retail stores last month with a suggested retail price of $495 for the complete M125 package.

"We felt this package to be relevant and competitive. The Macintosh user is used to a simple, easy-to-use product with flexible features," stated Bob Bauman, Vice President of Marketing for Prentice Corporation, "and as industry leaders in database access for terminal and PC users, the Dow Jones Straight Talk product offers the same ease-of-use. Straight Talk communicates with on-line information services (such as Dow Jones News/Retrieval and The Source). The Popcom products, with their simple "plug-and-play" features, complement this user-friendly package and brings the auto-voice data switching feature to the Macintosh world."

The Macintosh and Popcom share the same standard telephone line with no need for a dedicated line. Features such as complete call-progress monitoring, detection for dial tones, busy signals, remote ringing, and line disconnects can result in substantial cost savings

Prentice Corporation manufactures a broad line of data communications equipment that includes the advanced-design Popcom modem family, commercial high-performance medium to high-speed modems, and statistical multiplexer system products. The company, formed in 1971, is privately held.

For more information contact Prentice Corporation, 266 Caspian Dr., Sunnyvale, CA, 94088-3544, (408)-734-9810.

Mention that you read about it in the **Computer Shopper.**

Programming The IBM Personal Computer: Assembly Language by Chao C. Chien

Book Review by
Karl H. Meyer

A year ago I asked a friend who has been programming in Assembly Language for seven years if he could recommend a good book as a tutorial. His reply was unequivocal. "There aren't any." He was right, at the time.

Until Chien's book came along, I had been frustrated with this language, despite being familiar with BASIC, Pascal, Logo, Author, and a smattering of Fortran. If you've looked at most of the books that have been available, you've found yourself confronted with "the architecture of the CPU" in the first chapter, and then had to contend with binary math.

In the Foreword, Chien states, "The purpose of this book is to provide beginning programmers, including those who have not had one single lesson in programming, with a step-by-step guide to assembly language programming from the ground floor up to being able to write a decent assembly language program." He makes good on that promise, and after three hours with the book I understood more about assembly language programming than I had been able to glean from five other books, four classes, and many fruitless hours of study.

If you have ASM (IBM's Microsoft Assembler), you're in business. Nothing is taken for granted about your level of expertise; not only are you told to turn on the computer, you are advised to "make sure your monitor is turned on, so you may see what is going on." You are taken first to EDLIN and at each step you are shown what should be on the screen:

```
A□EDLIN B: START.ASM
            New File
                  *I
                1:* –
```

After you enter a brief, 39-line program, Chien explains what everything means, and even teaches you how to use the EDLIN editing commands, the Assembler and the Linker, explaining what each does. Each chapter contains one or more "Things to Do" boxes, and at the end of each of the ten chapters is a detailed summary of what you have covered. Scattered throughout each chapter are self-tests (with answers) to make sure you understand what you're doing and what each line of code does.

Yes, there is a chapter on "Computer Fundamentals" and binary arithmetic, 34 pages long. Let's face it; if you want to understand how the computer moves things around, you must know what it is dealing with. In addition to basic computer functions, you'll also learn the meaning of mnemonics, op-codes, pseudo-ops, and even be able to talk intelligently about the differences between an assembler and a macro-assembler.

Succeeding chapters take you from "Elementary CRT Output (MOV, INT)" through "Advanced CRT Output/Graphics" and "Advanced I/O" which covers printer control as well as file structure on the disk. Numerous "You Try It" examples will reinforce what you have learned, such as "Draw a square on the screen using the CRT memory map," and "Do the same, but with color." None of the actual programs in the book is over three pages long (most are less than one page), and these, along with the suggested exercises, give a solid grounding in clean, efficient assembly language programming.

Chien does not attempt to make this a reference manual; many of the "Things to Do" suggest you study the appropriate sections in your DOS manual. What he does do is make the material in the manual understandable to the novice. While it is not necessary to do all the suggested exercises, it will be time well spent to master what is considered one of the most difficult programming languages. Chien is not only an excellent teacher, he's one with a sense of humor, too, as you'll find on page 58: "Some More Fun For You: 1. Display ABC on one line, and DEF on another, starting both from the left-hand side of the screen. 2. Display all 26 letters of the CRT, each letter occupying one line." Unless you've read a few lines ahead you won't know you've been tricked; it can't be done, because the CRT will only display 25 lines, and Chien says of the missing letters, "do not run all over the place looking for them."

The book is aimed at the rank beginner, although Appendix C will be of value to experienced programmers. It is a compilation of 31 useful subroutines that you may store on your disk and call from other programs you have written.

The book was written for the PC and XT computers, and you will find some programs that are not workable with jr. Perhaps a second edition will devote a chapter to the differences between the PC and the PCjr. Despite the few areas of incompatibility, this book should be your first choice if you want to learn Assembly Language with your PCjr.

Programming the IBM
Personal Computer:
Assembly Language
Chao C. Chien
CBS College Publishing
(Div. of Holt, Rinehart
and Winston)
383 Madison Avenue
New York, NY 10017
Suggested retail: $18.45

The Electric Dragon

(The I Ching)

Review by
Karl H. Meyer

The I Ching is one of the oldest known books in the world, dating back more than 3,000 years. Confucius was an avid student of it, as was Carl Jung many centuries later. "The Book of Change is an attempt to explain chance happenings, those events in our lives which cannot be explained in terms of cause and effect," states the author in the brief manual accompanying the program. Whether you consider this merely a parlor game or not, the program can be fascinating as it provides much food for thought.

Long ago in the BC era (Before Computers), I spent a year and a half in Tokyo, where I observed people from all walks of life paying fortune tellers on the streets to interpret the meaning of the patterns of the sticks they tossed onto a table. Some used coins, and some of the more popular fortune tellers had small storefront offices where they conducted business. Each had a copy of the I Ching, or Book of Changes, from which he would read the meanings of the hexagrams created by the random patterns of the sticks. You asked your question, tossed the sticks, and then the fortune-teller interpreted the meaning.

Several of my Japanese friends insisted I "consult the oracle" one evening. Because I did not want to hurt any feelings by telling them I considered it foolish, I agreed, and we stopped on a corner of Ryo-Kan Dori where I went through the motions. They told me it was not necessary to voice my question aloud, for the oracle would know. My question concerned my future in Japan, and as the fortune teller interpreted my hexagram, I detected sadness on the faces of my friends. They translated it for me, and said they were convinced I would be leaving them very soon. I assured them I still had two years to serve on that tour of duty.

Three weeks later I was back in the states, doing a tour of a ward at Walter Reed Hospital.

Over the next few years I tried to learn something about the ancient art, but the books available left me with the impression that crystal balls, cards, and yarrow sticks all needed a good showman to keep the crowds amused. The most difficult part of divination is the interpretation of obscure statements, and being able to find all the cross-references to make sense of it all. This is where your PC does its magic. All of the Judgments and Interpretations are on disk, and the most that is asked of you is that you press any key 18 times to cast the hexagram. All the Hexagram titles, Images, Lines, and Judgments in the program are from "The I Ching or Book of Changes" from Princeton University Press.

The computer takes over from there, and builds the hexagram and displays the Judgments for you. While the Judgments can be vague, the Interpretations displayed on the same screen can be very much to the point, like the reminder that I had this morning to stop talking with the oracle and get to work.

I had spent several hours on each of too many days toying with this program, knowing that my deadline for this review was approaching fast. Despite feeling the pressure of finishing the project, I told myself, "One more." The question I asked was, "Will Stan be upset if I take more time with this?"

I cast the "yarrow stalks", and the hexagrams that appeared on my screen were number 2, The Perceptive, and number 40, Deliverance. In the interpretation was this:

"If there are any residual matters that ought to be attended to, it should be done as quickly as possible, so that a clean sweep is made and no retardations occur."

When I read that interpretation, I knew it was time to stop consulting the oracle and get this review written.

For convenience, I transferred the files to a system disk and created an AUTOEXEC.BAT file. If you do the same, be sure to include DATE and TIME prompts. Entering ICHING takes you to the title screen, and then the main menu. Your options are:

Consult the Oracle
Review a Reading
Study a Hexagram
Review Last Reading
Turn Prompts (On/Off)
End This Session

Studying the hexagrams before using the program will give you an idea of what is included. There are 64 hexagrams, and each one of them

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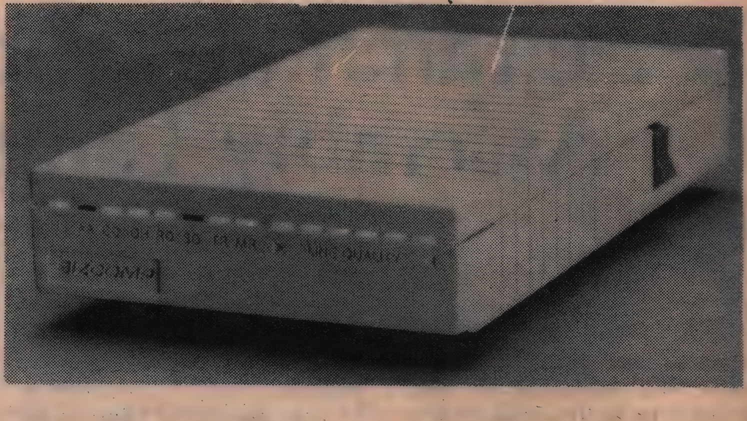
Bizcomp Voice/Data Personal Computer Modem

Bizcomp Corporation has introduced "**IntelliModem EXT**" (pronounced "IntelliModem External") which brings advanced telecom and datacom capabilities to PC users at down-to-earth prices. With quality and reliability emphasized throughout the design, this standalone 300/1200 baud communications system is packed with time-saving and convenience-oriented features, and is suitable for use with any serial RS232-equipped computer or terminal.



Especially significant is an exclusive Voice Insert capability which allows use of an ordinary phone to add integrated voice to a personal computer workstation. This means the user may very simply talk and listen, or send and receive data without having to hangup and redial. With phone charges on the rise, the benefits are lower phone bills, and greater productivity and convenience.

For data uses, compatibility with a broad range of comm software is acutely important to avoid application problems. IntelliModem EXT solves this through its Patented 100 percent Hayes compatible design. Numerous features have been added to improve convenience and increase productivity. A front panel multicolor Line Quality bar graph display dynamically monitors the telephone line condition. For the user, this eliminates the guesswork of determining error-prone marginal phone lines. Advanced Call Progress Detection lets the modem electronically sense telephone system signals such as Busy, Dial Tone, Remote Ringing, and Voice, and display these conditions on the computer screen. With this feature, the modem user always knows what is happening as the call progresses. Eight front panel LED indicators show the modem status at a glance and help to easily diagnose problem conditions.

Bizcomp Corporation invented "smart modem" technology in 1979 and has been manufacturing a full line of 300 and 1200 baud modems since that time. The company offers this patented technology in both standalone and board level products for OEM and retail sales. Other members of the IntelliModem family include three plug-in boards for the IBM Personal computer: the IntelliModem ST, IntelliModem XL, and a new half-card IntelliModem XT.

For further information, contact Bizcomp Corporation, 532 Mercury Drive, Sunnyvale, CA, 94086-4018. Phone 408/733-7800.

Mention that you read about it in the **Computer Shopper.**

No Copy Protection Of Ability Business Software

Ability, a new integrated software package with its own operating environment has now begun shipping to authorized IBM dealers in North America, and will not make use of copy protection software or protective devices, according to Robert G. Hryniak, president of Xanaro Technologies Inc.

"From the beginning," said Hryniak, "our primary goal was to make Ability so powerful -- and so easy -- that many more people could benefit from using computers. One of the most difficult choices we faced along the way was how to protect ourselves from 'software piracy.'"

Hryniak stated that industry experts had urged Xanaro to adopt "any number of copy protection schemes" for Ability. After a thorough survey of the alternatives, however, Xanaro decided that today's copy protection methods make software awkward to install and difficult to use. "That is the very opposite of what Xanaro stands for," said Hryniak. "We created the product to make things easier, not harder."

A note from Hryniak is inserted into each package of Ability and tells users, "make as many copies as you like -- for your own personal use.

The note also mentions the recently announced site and corporate licensing program for any organization wanting multiple copies of Ability. Ability is being sold individually for $495 a copy. However, qualifying organizations who sign the licensing agreement available from authorized Ability dealers, will be able, after an initial minimum purchase, to buy additional sets of five for $750, or only $150 each.

"We are confident that you and your organization will choose to buy one copy of Ability for each person who uses it," continues the note from Hryniak to purchasers of the product. "In short, we are trusting you."

Commenting on the company's decision, Hryniak noted, "The varied reactions from people who have learned about our policy have been fascinating. Some have

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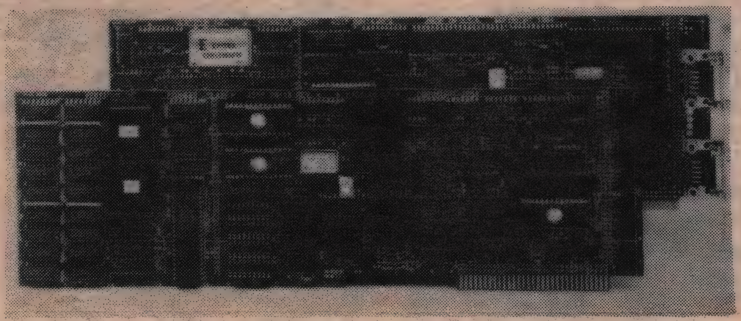
High Performance Graphics Controllers and Displays

Verticom, Inc., a designer and manufacturer of high performance graphics controllers and displays for IBM Personal Computers, announced two new plug-in high speed graphic controllers that will draw images at 1,000,000 pixels per second. These products are ideally suited for graphic artists, engineers, architects, and other scientific users.



The M-16 and the M-256 controllers will provide 16 and 256 colors respectively from a palette of 4,096. The high speed drawing capability is generated by a Verticom proprietary two micron CMOS graphics controller chip set with an on-board Motorola 68000 CPU.

To operate with the controllers, a high quality 60 Hz, non-interlaced RGB display, the CD-1, with 640 × 480 resolution was also announced.

Verticom's products are compatible with the IBM PC AT, PC XT, and the PC Expansion Unit. Verticom will support software that is compatible with the IBM Color Graphics Adapter, as well as support the two most prevalent PC graphics standards in the industry today -- VDI from Graphic Software Systems, and HALO from Media Cybernetics. These software interfaces ensure that Verticom's hardware products have immediate compatibility with a large existing application software base. Verticom

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IBM Graphics Display for Dual-Mode Graphics

Graphics display systems for the IBM PC which support both low-resolution business graphics and high-resolution CAD/CAM design software using one monitor were announced by TAT Graphics Group, Inc.

The TAT Sextant graphics display systems, designed for the IBM personal computer and PC-compatible machines, include a single-board controller and a color monitor, available in either a 14-inch or 19-inch display. To obtain dual-mode operation, a Sextant color monitor from TAT and an IBM color adapter card or its equivalent is required to run the low resolution business graphics.

In dual-mode operation, a Sextant graphics display system will support low-resolution business graphics packages such as the Lotus 1-2-3 product from Lotus Development Corp., as well as high-performance graphics application packages for a variety of design disciplines, such as those from Autodesk, Inc., of Sausalito, CA.

"Sextant graphics display systems offer a new level of flexibility at a very attractive price to professionals using IBM personal computers or PC-compatibles as combination standalone engineering workstations and business management tools," said Avery Blake, president of TAT.

A sextant graphics display system consists of a TAT Galaxy G640, G800, or GX1024 controller and either a 14-inch or 19-inch color monitor. The Galaxy controllers are based on the NEC 7220 graphics processor.

In addition to high resolution and large screen, the TAT systems offer a display of 16 colors chosen from a palette of 4096 colors. TAT products support the recently announced IBM standard of 640 by 480 pixels resolution, but also offer optional resolution of up to 1024 by 768 pixels.

"The IBM Personal Computer has created an enormous market for developers of graphics software packages, for applications ranging from simple business graphics to the very sophisticated design-oriented uses such as aircraft and naval engineering, architecture -- even cinematography. TAT's Sextant display systems support or exceed the IBM performance parameters and standards at a significantly lower cost," Blake said.

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Randy's Ravings

by Randy Holcomb

This month we look at 2 new pieces of software for the 99/4A: A Flight Simulator, and a disassembler utility, along with the usual news and rumors in the TI mill.

Flight Simulator For TI 99/4A
Moriah Software
832 S. Knoxville
Tulsa, OK 74112
918-832-8825

Once again we have another program that attempts to give you that sensation of flying with the assistance of computer simulation. However; for 99/4A owners, no package has come around that even approaches the level of sophistication of MicroSoft's Flight Simulator or subLOGIC's program. Moriah Software makes an attempt at achieving such levels of sophistication with their product called FLIGHT SIMULATOR.

The program package provides 3 scenarios: a flight simulator, a bomber simulator, and an attack simulator, all written in Extended BASIC. Unlike most flight simulators all the information is displayed as raw numerics on the screen — no needle balls or gauges as you would find on other simulators. Also, all input is from the keyboard — no joysticks are used. The simulator does make nice use of the graphics available and makes use of color in its display modes.

The screen is split into three main areas: the first area is for visual navigation and shows the field where you are landing (and puts up a red plane to show you your approach). The background color indicates your relative distance to the landing field. Included in the upper portion of the display are readouts for ground level, altitude, total elapsed time, air speed, glide indicator, wing-temperature, range (for bomber simulations) and heading.

The second third of the screen has a cross-hair in the middle which changes color depending on your beacon bearing (if you are on course it flashes green, if you are over the beacon it will flash red;) with a climb indicator to the left and to the right data on the homing beacon (indicating bearing, beacon name, distance and ETA).

The bottom portion of the screen contains status information of the landing gear, flaps, fuel remaining, engine RPM speed; and status information or the bomber simulation (number of missles fired and kill factor).

The simulator has a demo mode which shows how the plane lands and the instructions suggest that you watch how the plane is landed. When actually flying the craft, high-pitch warning beeps may sound indication that trouble awaits if you don't back off your present parameters; I have caused many a wreckage because of too low of an airspeed or melted wings.

Analysis and Recommendation

Let's be honest: a subLogic or a MicroSoft flight simulator this isn't. And there are many other simulators for other machines that make this look pale by comparison. However, Moriah Software should be commended for at least taking a stab at getting one to market. Myself, I'm no big fan of flight simulators. But if you have an interest in such programs or would like a "game" that's just a tad different, give this one a try.

MORE THAN A
DISASSEMBLER…
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Now THIS is something that no /4A hacker should be without — a full blown disassembler with documentation and additional programs that help you disassemble object code back into SOURCE code. Cumberland Technology has released a package that combines a disassembler with some useful utilities both inside and outside the disassembler: it allows you to trigger CRU addresses, display the DEF symbol table, access VDP memory, print binary and text listings, as well as disassemble, with the provision of placing the listings to an output disk file — this is the KEY feature of this disassembler as we will see later on.

One of the favorite topics in many users group meetings is "backing" up certain ROM-only cartridges of games, utilities adnaseam. While such an exercise can prove educational it is also the basis of most of the software pirating going on these days.

Unfortunately, the disassembler lies at the heart of these activities. Before I proceed with the steps involved I want to make it perfectly clear that these techniques are for use in seeing HOW a program is organized and how it functions — NOT for piracy. Anyone who uses these tools for piracy is slitting their own throats and other owners as well.

Disassembly Dilemma. One of the problems when working backwards from object code to obtaining the original source code is determining what is data used by the program and what is the execuable code. Also problematic is determining where a program starts execution. Cumberland's program conveniently gives you a start in both of these areas by allowing you to not only disassemble raw object code but to print ASCII and hex data. You really need all of these before you start reconstructing the source code. Also, determining the start of the program is made easy by the Cumberland disassembler via the T command — it prints the symbol table used by the linking loader. If you see the name of the program in the symbol table listing then you know where the program starts. If you are disassembling a cartridge, DSR or the console ROM then the start of the program can be found in the ROM header linkages for cartridges and DSR's, while the console ROM takes the WP at a >000 and the start of the program at >0002 and takes off from that point.

Armed with all this data, Cumberland provides en Extended BASIC program called LABEL which takes the output disassembly listing and creates a display variable 80 file which contains source assembly statements and labels. At this time their label program replaces addresses that fall within the scope of the start

Continued on page 46

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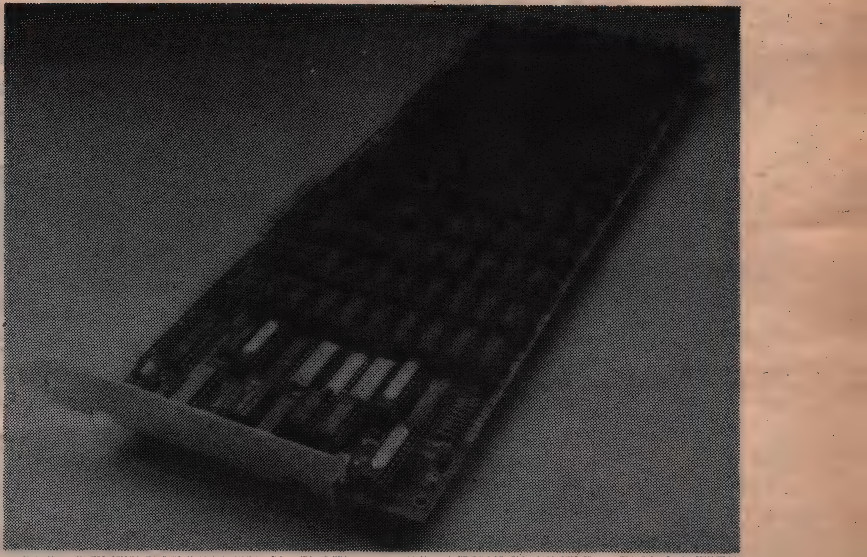
3 Megabytes Of RAM On The IBM PC/AT!

Emulex Corporation introduced the Mega Memory, the newest offering in its Persyst product line. The Mega Memory provides up to 3 MBytes of RAM for the IBM Personal Computer AT, allowing users to take full advantage of the AT's 16-bit data bus and extended memory addressing capabilities.

A full-size printed circuit board, the Mega Memory fits into any of the 16-bit slots of the AT. This one board memory solution offers users high reliability and easy installation, as well as compact size.

The Mega Memory offes 0 KB to 3 MBytes of RAM memory. A total of six banks, representing 12 rows, can be populated using either 64K or 256K chips, depending on the AT configuration. With this flexibility users can fill base memory and expand upper system application memory at the same time.

Utilizing single board design, the Mega Memory offers many advantages. Reliability is greatly increased by eliminating piggy-back boards with connectors that can fail. A single board is easier to install and saves space. It also allows maximum card spacing for optimum cooling and enhanced reliability.



Standard with the Mega Memory are two software packages, Wait-Less Printing and Insta-Drive. Wait-Less Printing adds the convenience of print spooling, so users can print documents while the PC is busy with other tasks. RAM disk emulation is provided by Insta-Drive which sets aside portions of memory to operate as floppy disk drives, improving access time and efficiency.

Physically, the Mega Memory measures 4.5" × 13" and it uses 3.4 amps at 5 volts. List price ranges from $395 with OK RAM up to $5495 with 3 Megabytes RAM. First units were scheduled for March 1 shipment.

Every Persyst board is circuit tested then burned-in at 55 degrees Centigrade for 24 hours. Each board is then run through all IBM diagnostics inside a PC a minimum of five times. Emulex Persyst products feature a full two-year limited warranty and are fully backed by an expert service and applications staff.

For further information on these products, contact: Phillip (Flip) Begich, vice president, domestic sales, at Emulex Corporation, 3545 Harbor Blvd., P. O. Box 6725, Costa Mesa, CA, 92626, (800)-854-7112, in CA (714)-662-5600.

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National Headquarters
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Fort Lauderdale, FL 33329
Attn: Membership Division

Randy's Ravings
Continued from page 45

and stop addresses; however with some time the utility could be written to do back-stuffing of addresses; also jump and branch instructions have a @ prefixing the address.

By examining the output of the label program and the ASCII and hex listings data areas should stand out, whereby the assembled code generated can be replaced by appropriate DATA, BYTE, BSS, BES, and similar assembler directives. This process is iterative (repeats itself) until runnable code is achieved. As you proceed in this process studying the disassembled code will start revealing certain patterns of its actions, these can be commented in the source directly and make the disassembly process more rewarding. There is no magic key that unlocks the disassembly process — it takes time, perseverance, patience and a willingness to work at it — but with tools like Cumberland Technology's disassembler the task is made much easier.

TI News. The TI Forum celebrated its 1st anniversary on CompuServe in February and passed the 30,000th message mark — not bad considering the majority of its membership is using the "orphanded" 99/4A. Special anniversary conferences with many key 99/4A personalities were held and transcripted, so if you haven't paid a visit recently you may want to take the time and cruise by.

Rumors are that Myarc is modifying their disk controller to be able to read CorComp double-density disks as well as their own standard; and will be releasing a disk manager software to be included with future card shipments; check with your local dealer for more details.

I'm still waiting to hear from you TI professional owners as well. Just because there are a lot of 99/4A's out there doesn't mean we're ignoring you. Article suggestions are always welcome!

Next Month: MicroText Bizmaster review, more of the "Upgrading the TI 99/4A" series and more news and rumors in the TI world. ●

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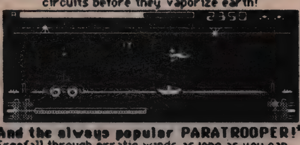

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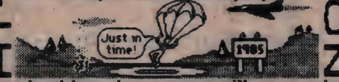

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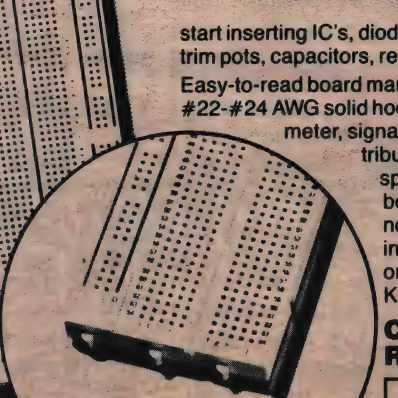

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COMMODORE

Inside The VIC-20/Commodore 64

Building A Parallel Printer Interface

Part 2: The I/O Chips

by Ted Drude

I/O Chips.... Away!!!

In case you haven't guessed, this month we'll be looking at I/O (input / output) interfacing chips that are used in the VIC and 64. First, understand that you don't have to grasp all the details of these chips in order to use the cheap Centronics interface I presented last month. I'm just including this information for those of you who are hardware hackers and experimenters and want to know how things work, at the chip and assembly language level.

I have received a letter asking for an address for the book "Inside Commodore DOS" that I mentioned a few months ago. In response to that, I am going to implement the convention that is used by several authors of including an address listing at the end of each article. It will have the names and addresses of each company whose products are mentioned in the body article. Hopefully, this will be of help to our readers.

I'm also including a couple of addresses for the book "1541 Maintenance Manual" by Michael Peltier. It covers the hardware of the 1541 better than anything I've ever seen and is an excellent book.

I've got to comment on the good news for 64 owners and Commodore fans! I've been reviewing the technical details of the new C-128 computer. All I can say is WOW! This is one we've all been waiting for. Commodore finally got it right. Good job Commodore! I'll have a little more to say concerning the 128 and some other topics at the end of this article, but first let's look at this month's technical subject: the Interface Adapter (IA) chips of the VIC-20 and C-46.

The Centronics project (see Computer Shopper, Page 53, April issue) presents an excellent opportunity for us to look at the IA chips. This article will be ueful to you even if you have no desire to implement the Centronics interface. We'll be looking at how to initialize and use the IA chips in general and you can apply this to many different uses of the User Port.

What's An "IA" Chip

Some time ago, I mentioned the fact that the VIC and C-64 designs included three general sections: 1) CPU/RAM/ROM, 2) Audio-Video Interface, and 3) Peripheral I/O Interface. Each section has a major programmable chip that's in control of that section. In the VIC the 1) 6502 CPU, 2) 6560 VIC I, and 3) 6522 VIA controls each section respectively. In the C-64, it's the 1) 6510 CPU, 2) the 6567 VIC II/6581 SID, and 3) 6526 CIA that do the same job only with more capability and features.

(Refer to Figure 1)

The VIC has two 6522 VIAs (Versatile Interface Adapter) for peripheral interfacing while the C-64 uses two 6526 CIAs (Complex Interface Adapter). The IA (Interface Adapter) chips control the peripheral interface lines to the microprocessor bus of each computer. Like all the major chips, they are under software control of the CPU, which initializes them, reads and writes to their ports, and services their interrupt requests.

Why I/O Chips?

You may ask "Why does the computer need interfacing chips? Can't it just get the data it needs straight off the address and data busses?" The answer is "YES" and "NO". The CPU does get data "straight off" the data bus but that data must be presented in a readable and usable form to the CPU. For more than just one or two usable peripheral data addresses to exist at one time, external signals have to be interfaced to the main data bus through addressable data ports. Therefore some addres decoding is necessary and this would be impossible if external data signals were "hard wired" into the data bus. The data port addressing capability is provided by the IA chips. In addition, they buffer external signals and provide substantial

Continued on page 185

Interface Adapter Chip Register Maps

Address	VIC-20 VIA #1	Address	C-64 CIA #2
$9110	Port B (ORB)	DD00	Port B (PDRB)
9111	Port A (ORB)	DD01	Port A (PDRA)
9112	DDRB	DD02	DDRB
9113	DDRA	DD03	DDRA
9114	Timer #1-L	DD04	Timer A-L
9115	Timer #1-H	DD05	Timer A-H
9116	Timer #1-latch L	DD06	Timer B-L
9117	Timer #1-latch H	DD07	Timer B-H
9118	Timer -2-L	DD08	TOD - 10ths
9119	Timer #2-H	DD09	TOD - Secs.
911A	Shift REgister	DD0A	TOD - Min.
911B	Aux. Control Reg.	DD0B	TOD - Hour
911C	P C R	DD0C	S D R
911D	I F R	DD0D	I C R
911E	I E R	DD0E	C R A
911F	Part A (no handshake)	DD0F	C R B

Fig. 2 (Refer to text for more detailed info.)

VIC/64 System Block Diagram

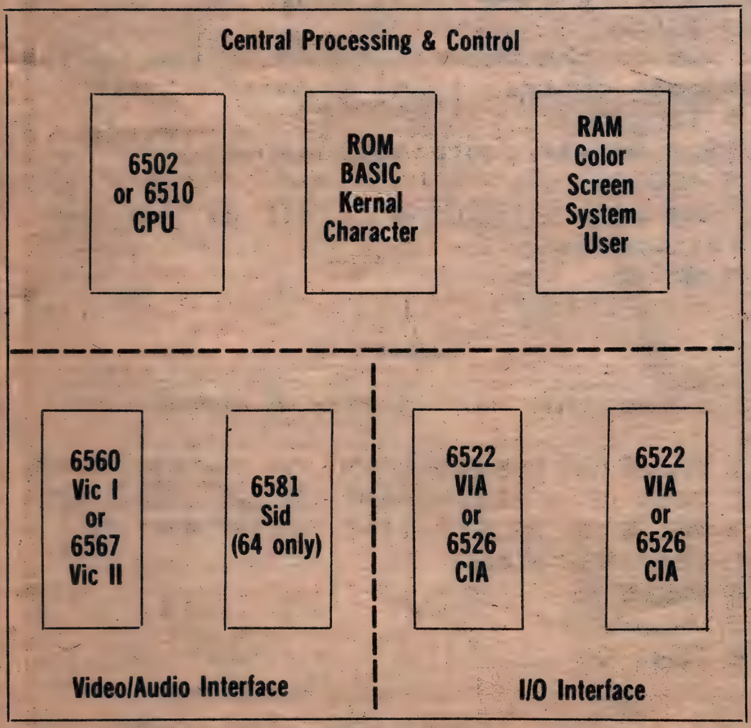
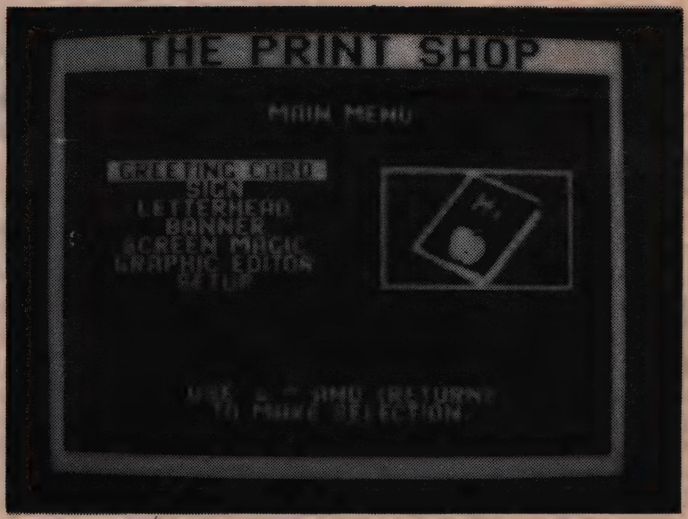


Fig. 1

Print Shop

by Cheryl Peterson



This program may well be the recipient of the Cheryl Peterson Annual Award of Excellence for Innovation and Programming Perfection, 1985. (I know it's still early in the year, but this package is great!) Print Shop is unique. It is not a copy of a tried and true old standard. In fact, I have seen **NO** programs like it on the market. Of course, the copycats may have hit the streets by the time this article sees print.

Print Shop is just what its name implies. It can print greeting cards, invitations and announcements, letterheads and stationery, signs, banners of any length and all kinds of cute graphics; the kind of things you would have your local printer create, if you wanted quality printing. You'll still have to go to a printer for customized personal and business checks or business cards, but what do you want for $50.

The designers of this program did an excellent job. The start up menu offers seven options, including a setup feature that lets you designate your type of printer. The first time the program is booted, this is the option that is highlighted in reverse video. Using the arrow keys moves the highlighting up and down the list to the one you want. You press the RETURN key to select your choice. Once you've chosen your printer type, the greeting card option will be the default setting when you boot the program.

The Main Menu has options for creating a greeting card, sign, letterhead, or banner. Another option called screen magic creates kaleidoscope patterns that can be put behind

Continued on page 99

The Cost And Value Of Your Retirement Fund

by Albert M. Koller, Jr.

When this package arrived in the mail for evaluation, my first thought was to put it away for 10 years and come back when I needed it. After all, it will be awhile before retirement - right? But after looking at the very thorough and informative documentation that comes with the program, the message was clear: start now, or you may not be able to retire when you are ready!!

"Your Retirement Fund" is a software and document package from PERFAS, Inc., Sharon, CT, that provides comprehensive analysis of several investment and tax options. Written for the Commodore 64, the program comes on a single disk and is Blitzed! so modifications cannot be made by the user. Although the manual is somewhat technical, giving the reader a short course in financial terminology, the program is easy to use. Following the prompts, a user can find the final value for a planned investment or the answer for one of several special investments such as a zero-coupon bond or a certificate of deposit. If those things sound too complicated, don't worry! You need only follow the prompts to supply all but one of the variables and the program will calculate the unknown. You can even find the results for a given inflation rate or a predicted Consumer Price Index.

Using The Program

This program is "menu" driven, beginning with condensed instructions which serve as a sort of "help" function for the new user. Load "$",8[Return], then [List] to get to the program directly. The Menu itself is divided into four parts to allow the user to select the type of answer needed. For example, the Part 1 menu, shown in Figure 1, allows you to compare the results of similar dollar amounts invested in different ways. It shows the concept of compounding money over time, giving results of various choices you stipulate. By choosing an investment amount, a time frame, and a yield, you can find the rate of interest equivalent for your investment. Figure 2 shows a result for INVESTMENT RETURN given by filling in the prompts in the order they appear and receiving the answers (listed as "key calculations") directly from the program. After you have a chance to try a few "runs," you will be able to evaluate for yourself which "experiment" will tell you what you want to know.

The Part 2 menu provides a series of calculations based on the "pay-in" phase of your investment. Using the amount you expect to pay in, the tax rates which apply, and the time frame used, the program answers how much the fund grows over time, how much you will have at the end of the program, and the **present value** of your final investment - what the end amount is really worth in dollars **today**. The menu is shown in Figure 3.

Figure 4 (see page 191)

The results are given for one case in Figure 4.

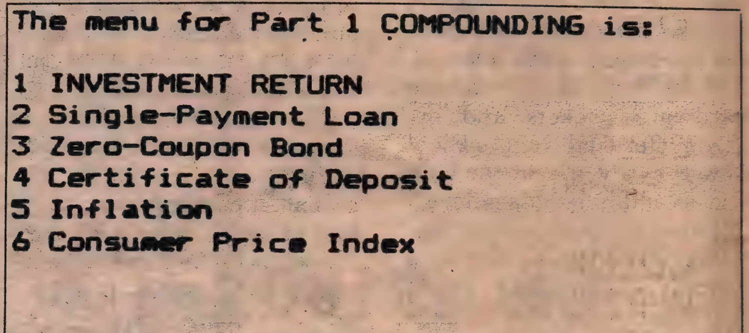
Figure 5 (see page 191)

Part 3 gives several options for calculating how much you are able to withdraw over time, as well as how much you are **required** to draw out for special tax-deferred plans. Both single lump sum withdrawal and various amounts drawn over time can be specified. These are somewhat technical issues, but they provide powerful tools for anyone who needs to compare alternative plans for finances. The menu is shown in Figure 5, and a table of typical results is given in Figure 6.

Figure 6 (see page 191)

Finally, as an added option, Part 1p is a repeat of the Part 1 menu, but with more elaborate prompts for those users who want them. This allows you to delve more deeply into the heart of the program and serves as a sort of tutorial.

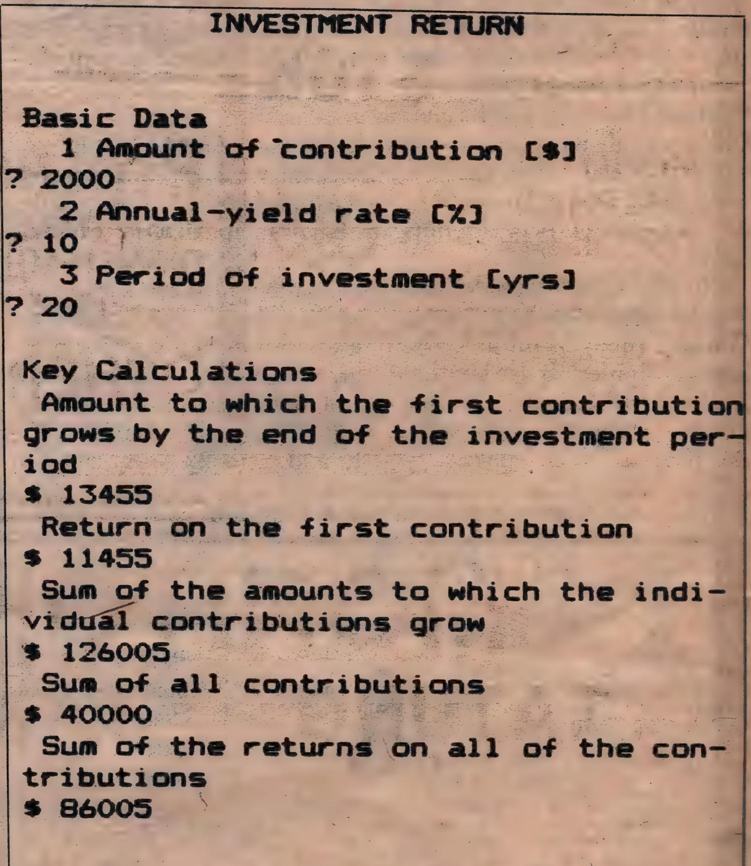
Continued on page 190



```
The menu for Part 1 COMPOUNDING is:

1 INVESTMENT RETURN
2 Single-Payment Loan
3 Zero-Coupon Bond
4 Certificate of Deposit
5 Inflation
6 Consumer Price Index
```

Figure 1

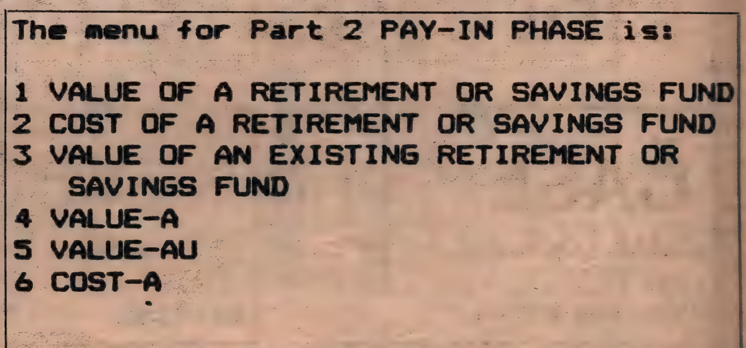


```
              INVESTMENT RETURN


Basic Data
   1 Amount of contribution [$]
? 2000
   2 Annual-yield rate [%]
? 10
   3 Period of investment [yrs]
? 20

Key Calculations
  Amount to which the first contribution
grows by the end of the investment per-
iod
$ 13455
  Return on the first contribution
$ 11455
  Sum of the amounts to which the indi-
vidual contributions grow
$ 126005
  Sum of all contributions
$ 40000
  Sum of the returns on all of the con-
tributions
$ 86005
```

Figure 2



```
The menu for Part 2 PAY-IN PHASE is:

1 VALUE OF A RETIREMENT OR SAVINGS FUND
2 COST OF A RETIREMENT OR SAVINGS FUND
3 VALUE OF AN EXISTING RETIREMENT OR
   SAVINGS FUND
4 VALUE-A
5 VALUE-AU
6 COST-A
```

Figure 3

Gwendolyn

by Cheryl Peterson

Here's a nice little adventure to save an otherwise dull afternoon. Search the countryside (and the subterranean lands below) and find the missing princess. Free her from her prison cell where she is being held captive by an evil army of dwarfs. Sounds exciting, doesn't it?

Gwendolyn is a very nonviolent adventure game. Nowhere along the way are you required to wrestle dragons or behead errant knights. Thank goodness. I much prefer games that require more intelligence than belligerence.

The plot and action of the game are great. There are a number of obstacles to be overcome along the way, some of which can't even be seen. Making a map of your journey is certainly essential if you want to win. There are clues, keys, and treasures to be gathered as you go. And like any good story, this one has a surprise ending. (No, I'm not going to tell you what it is!)

One big difference in this adventure is the command structure. Unlike text adventure games, Gwendolyn uses a joystick. There are two menus involved. The first has N, S, E, and W arranged like compass points. Using the joystick to put the cursor on a direction marker while simultaneously hitting the fire button moves the player in that direction.

At first the system feels a little awkward because the cursor centers in the middle of the directional letters if you let up on the joystick. Pressing the fire button when the joystick is in this position takes you to the second menu. Also there is a second's hesitation before the cursor follows the joystick. The only damage done is the wasted second while you press the fire button to get back to the first menu.

The scenery surrounding you is reflected on the screen. Any objects of interest are named as well as appearing in graphic form. I thought the illustrations for the game were nicely done, nothing exceptional, but nice nonetheless.

The second menu need only be accessed when you wish to perform disk functions, or pick up or use an object, or check your score or inventory.

Many of the "treasures" along the way appear to be useless, but may well come in handy later on. Any object that is used where it has no application blows up; destroying its usefulness, but not hurting you. It's a good idea to save your game status before trying to use an object of which you are unsure.

Clues on where to use certain objects can be found in some of the out of the way rooms. Of course, the clues are printed in some arcane languages, so you may have to find yourself a translator.

There are several levels which you must pass through. Things are not always what they seem. In fact, the entrance to the underground world is fairly well hidden. Good luck trying to get in. And once you do, doors have a way of slamming shut behind you.

I thought this game was a pleasant way to pass an afternoon. For some, it may take a few days to struggle through to the end. The graphic that congratulates you when you've finally finished is not the most fantastic I've ever seen, but it certainly is welcome after hours of stumbling around in a cave.

At $19.95, this program is priced right. Not too high, not too low. I've blown that much on an afternoon's worth of movies that I haven't enjoyed nearly as much.

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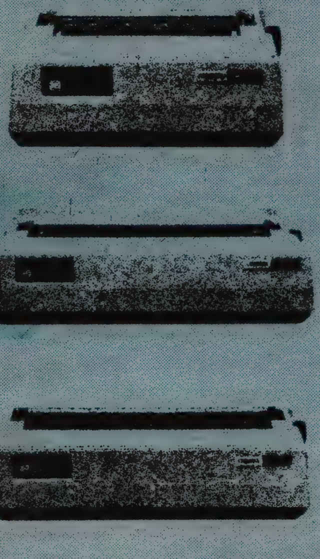

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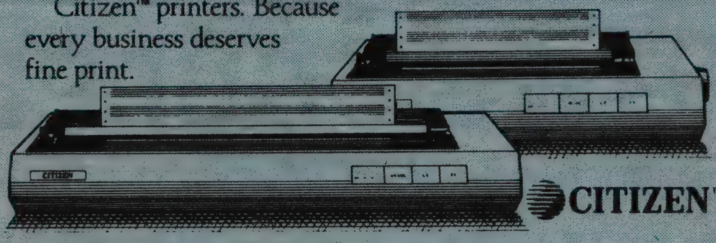

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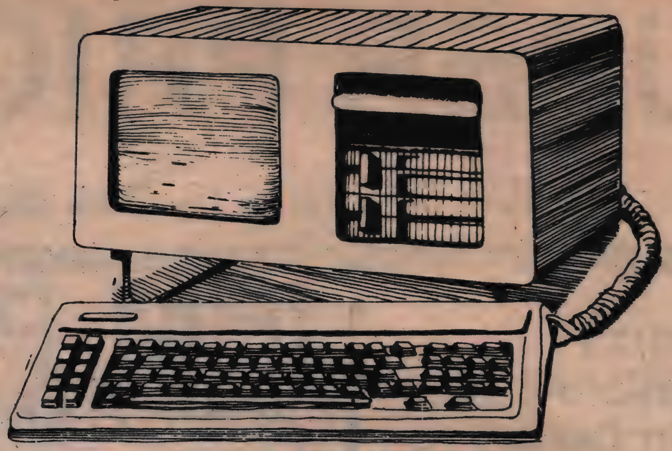

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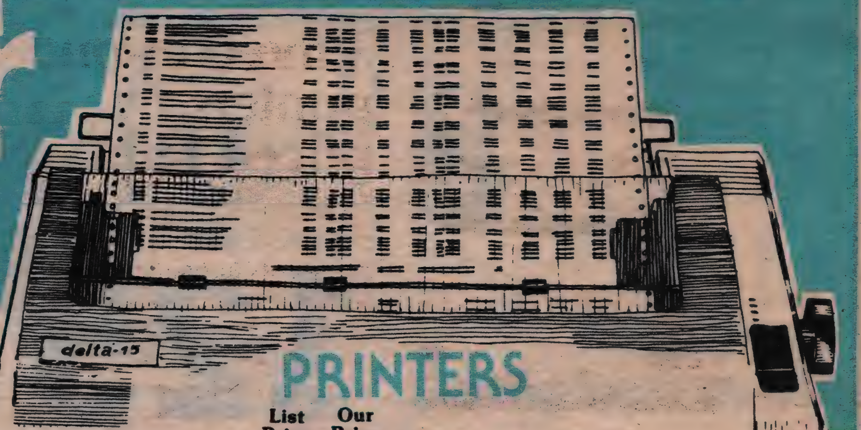

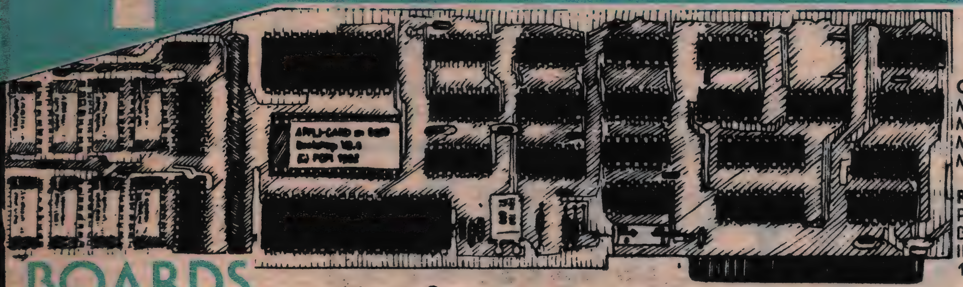

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Applying The Atari

by Jeff Brenner

This month's feature program utilizes a capability of the Atari called the *display list interrupt* to help you liven up your Graphics O display. We'll also look at the reader mail, programming tips, and a recap of instructions for Program Perfect for our newer readers.

Reader Mail

While readers' questions are far from in short supply, I would like to see more letters with contributions, such as short programs or helpful advice, from which other readers may benefit. A three-dimensional, holograph sticker will be sent to each contributor of an item printed in this column. Also, if you have an idea for a program but cannot implement it yourself, send me a program request. If the program will be useful to other readers, it may be developed and printed in a future issue.

I have a Trade-Wind Instruments model A-1 Anemometer I would like to interface with an old Atari 600XL I have. The anemometer has a generator on it so when the wind spins it around it produces a variable voltage which translates into wind speed in mph.

I asked the Trade-Wind folks if they knew anything about doing this but they didn't. They sent me the enclosed reprint from BYTE magazine, but I can't understand what the article is talking about.

I would like to get the wind speed from the anemometer through one of the joystick ports. Then have a program to get the wind speed say once an hour and store it for later retrieval.

I have no idea how to go about doing this; maybe it's impossible? Any help you can give me would be greatly appreciated.

Greg Matlock
Hays, Kansas

The joystick ports on the Atari can be used to read a wide variety of instruments, including your anemometer, providing that interfacing is properly done. A digital anemometer might be the easiest to interface to the Atari since its output is binary-coded decimal data. This could be read through the ports with a minimum amount of extra circuitry; however, you would have to write a routine to interpret the incoming data.

Since you did not specify whether or not your unit is a digital anemometer, I am assuming that your model simply generates a voltage relative to the wind speed. In that case, you would have to either use a circuit to convert the signal to binary-coded decimal data, or convert the varying voltage into a varying resistance, which could then be read like a game paddle. Specific details for doing this are beyond the scope of this column.

I recommend that you try contacting the author of the article enclosed with your letter. His article discussed interfacing an anemometer to an S-100 system, and he might be able to help you to do the same with your Atari.

I also recommend that you and any other readers interested in interfacing external devices with their Atari computers read "Control Your Environment with the Atari 400/800" (by David Alan Hayes, *BYTE*, July 1983). This gives some general information on controlling and monitoring devices through the joystick ports. Most of what is discussed applies to the XL and newer XE Atari units as well.

You might also attempt to contact a technician at Atari (1265 Borregas Ave., Sunnyvale, CA 94086) to assist you or direct you to other sources.

Interfacing your anemometer to your computer is not an impossibility. First get the details on doing so. Then, if you are not experienced in constructing circuits, get the help of a friend familiar with electronics.

I am strongly considering buying one of the new Atari ST machines when they are released. I have two questions: (1) Are they Macintosh compatible? (2) Would you support the new machines in your "Applying The Atari" column?

Rob Murray
Montgomery, Pennsylvania

Although the Atari ST is known as the "Jackintosh" in certain circles (after Jack Tramiel), it is *not* software compatible with Apple's Macintosh. Come on now — ultra-high resolution color graphics, multiple ports and interfaces, sound capatibilities, and Macintosh compatiblity for under $1000? That would be too much to ask for!

If the new Atari units catch on and if there is demand among readers for information on them, I would certainly devote space to these new models.

Programming Tips

It isn't necessary to go to DOS when you want to format a disk to save a program. Loading DOS (if no MEM.SAV is present) will wipe out the program you're working on. A truly useful method of formatting a disk without leaving BASIC is the XIO command. To format a disk in single density, enter:

```
XIO 253,#1,33,87,"D:"
```

For double density (available on the 1050 drive only), enter:

```
XIO 253,#1,33,127,"D:"
```

If you do this on a disk that already has programs on it, you will erase the disk, so be careful.

Herb Collins
Long Beach, California

I have discovered one cause of the infamous Atari 400/800 BASIC hang-up in which the Atari refuses to process user input. It seems that pressing SYSTEM RESET while the computer is in the middle of certain operations can mess things up.

For example: you type PRINT A$ to print out A$, a long string. The computer hesitates, and you, fearing that a system crash might be developing, press SYSTEM RESET in your attempt to avert disaster. However, when you now try to enter a line, the computer hangs up. Had you waited two to three seconds for the string to be printed out, everything would have been fine — Atari BASIC normally hesitates when printing out a long string while it rearranges its memory. But pressing SYSTEM RESET might leave the Atari in some kind of half-rearranged memory state — probably sufficient cause for a BASIC crash.

You should wait for the READY prompt before pressing SYSTEM RESET, and use BREAK instead of the reset key to interrupt program execution to greatly reduce the occurrence of the hang-up. [Atari

Continued on page 54

Space Tablet Introduced At Winter CES

Soniture, Inc. introduced a new dimension in personal computing. The product introduced was a 3D input device to all the popular personal computers called the Space Tablet.

The Space Tablet is comprised of a receiver frame that can be placed anywhere but is most appropriately positioned on top of the computer display, and a pencil like pointer (transmitter) that is held in the hand of the user at a distance of up to six feet in front of the receiver frame. The receiver frame detects the position of the pointer in all three dimensions (X,Y,Z) and reports that information to the software via the joystick port on all of the popular home and personal computers (Atari, Apple, Commodore, IBM PC and PCjr).

The Space Tablet utilizes patent pending ultrasonic technology for the detection and measurement of the three dimentional coordinates of the sonic pointer within the field of the receiver. The direction of the pointer is not critical and it is envisioned to be attached to other devices operating in the six feet field of detection in front of the television or computer monitor in applications of entertainment, education, or industry.

"The computer keyboard is a creature of habit that is rapidly being bypassed as a computer controling device," comments Paul Terrell, President of Soniture, Inc. "the recent popularity of mice, touch tablets, and light pens support that theory but they fall short of the main objective in making the human interface more natural because they lack the ability of reporting the third dimension or "Z" axis and they require you to develop a new coordination of moving your hand in one area while you are looking in another direction."

Soniture is marketing the Space Tablet as a stand alone product through computer speciality stores and mass merchants. A Software Sampler diskette is included with the Space Tablet so that the consumer will be able to operate the product out of the box. Soniture will provide a sample version of popular programs from major publishers as a teaser to the consumer to pur-

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Applying The Atari

Continued from page 53

says that this bug has been rectified in the BASIC in the XL and XE models, so this tip applies only to 400 and 800 owners.]

G. Scott
Bronx, New York

Program Perfect Recap

Last month, Program Perfect was listed in its entirety for those new to *Computer Shopper* and for those who missed the revision that followed the original listing. This also allows us to point to one single issue (April 1985) when referring to this program. This month we'll review the features of Program Perfect and how to use them. If you are already familiar with Program Perfect, you can skip to the "Multi-Luminance Graphics O" section to start entering this month's program.

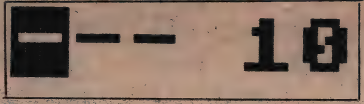
Before we start using Program Perfect, check over your typing a few times to be sure there are no errors. You don't want a bug in a program that checks other programs for errors!

We'll use the short program listed under the "SAMPLE PROGRAM" heading to test Program Perfect. The three letters to the left of each line number is the code used by Program Perfect to check the line for errors, and to determine the next line for its automatic line numbering feature.

SAMPLE PROGRAM

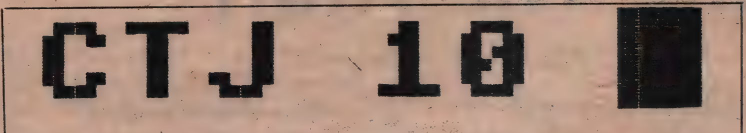
```
CTJ 10 REM TEST OF PROGRAM PERFECT
LAJ 20 PRINT "THIS IS A TEST"
WMJ 30 GOTO 20
OJZ 40 END
```

RUN Program Perfect. When you're asked to enter the starting line, enter the first line of the program you are entering. In the case of this demonstration program, enter 10 and press RETURN. Figure 1 shows how the line below will now appear.



```
█-- 10
```

The three hyphens preceding the 10 are for the three-letter code. When you type the code for line 10, the display will appear as in Figure 2.



```
CTJ 10 █
```

FIGURE 2

The cursor will have moved past the line number to allow you to enter the program line. Type in the remainder of line 10 and press RETURN. Program Perfect will perform a few screen manipulations below the line you have entered as it checks the line for errors and places it in the Atari's memory as a real program line. You'll get a buzz and an "ERROR - TRY AGAIN" message if you've made a syntax error, or if the line does not otherwise check against its three-letter code. An error in typing the three-letter code will also trigger the error message. After the error message is printed, you'll have to enter the three-letter code again, but the rest of the line will remain intact so you may correct it using the cursor control keys. To erase the entire line and the code, press SHIFT-CLEAR. Program Perfect will not allow you to move the cursor out of its three-line entry area.

If the line is entered correctly, the program will automatically display the next line number of the program. Enter to codes and program lines for each line number that appears until the entire program is entered.

Program Perfect allows you to use all abbreviations, such as GR. for GRAPHICS and G. for GOTO. However, do not use ? for PRINT or vice versa as the computer treats these as two different commands. The same goes for GOTO and GO TO. Use PR. as an abbreviation for PRINT, and stick to the one-word GOTO, as this is the only form that will appear in the programs in this column.

You do not have to follow the exact spacing of the program line unless the spacing is within quotes.

After you enter the last line of the program (which has a three-letter code ending with a "Z"), Program Perfect will print "END OF PROGRAM - STAND BY." It will then take about five seconds while it erases itself from memory and leaves you only with the lines you have entered. You can then list, save or run your program.

If you don't enter the whole program in one sitting, you can press BREAK and SAVE what you've already typed. Since Program Perfect is in memory, you will be saving it along with the lines of the program you have entered. When you are ready to enter more of the program, simply LOAD it back in and type GOTO 30000 (the beginning line of Program Perfect). Then enter the line number from which you want to continue for the "Starting number:" prompt and enter the rest of the program.

Multi-Luminance Graphics O Screen

This month's program gives you the chance to enhance your Atari's Graphics 0 screen. Graphics 0 is the mode in which you program. With the SETCOLOR command, characters on the Graphics O screen can be set to any one of eight luminance levels. However, the Atari operating system does not provide for mixing text of different luminance on the same screen; a feature which can greatly add to the visual appeal of the display. To accomplish this, a display list interrupt could be set up.

The *display list* is a section of computer memory which contains a series of mode-display instructions for each line of the screen. A Graphics O screen would contain 24 instructions to display a line of graphics mode zero text, thereby creating a 24 line display. A *display list interrupt* is an instruction in this display list which causes the computer to temporarily halt its current operation and to instead jump to some routine in memory. After this routine is executed, the Atari resumes its normal activities. The most important aspect of this display list interrupt routine is that it is executed while the screen is being drawn. Therefore, the Atari's color registers could be changed mid-screen if desired, and the change would be visually apparent on the video display.

The Multi-Luminance program that follows works on this principle. It uses 24 interrupts, one for each line of the screen, and is therefore able to assign a new luminance level to each line of text.

Enter the Multi-Luminance program under Program 1 and LIST it to cassette or diskette so that you may merge it with other BASIC programs. Now, *without erasing Program 1*, enter Program 2. Program 2 is a sample application program which shows off one use of a display with multi-luminances.

RUN the program. After a few seconds, a display is generated which takes advantage of the many different intensities available. The sample menu shows CHOICE 1 illuminated, while the other choices are dark. By pressing the SELECT key, the next choice is illuminated, and so forth. Pressing START would initiate a particular selection if this menu were being used in a full-length program. In this demonstration, pressing START will tell you what choice was selected.

This attractive method of menu operation could not have been done on the normal Graphics O screen. The Multi-Luminance routine (Program 1) sets the line containing the selected choice at the highest intensity, while it sets the other at the lowest intensity, to obtain this interesting effect.

Next Month

You'll learn how to use the Multi-Luminance program to set each screen line to the luminance of your choice, and how to incorporate this into your own BASIC program. Next month's feature program is a powerful mailing list keeper (name/address/category) for disk systems with search, editing, and double-width label printing capabilities. It works with either single or double density (DOS 2 or DOS 3). This program is one you won't want to miss.

Readers' questions, comments and contributions are welcome. Please enclose a self-addressed, stamped envelope (SASE) for a personal reply.

A cassette or diskette of any program listed in this column is available from the author for $5, postpaid. Specify DOS 2 or DOS 3 when requesting a diskette.

Program Perfect is a utility used to check for typing errors in programs entered from this column. Readers may send a SASE for listing.

Address all correspondence to:

Jeff Brenner's
"Applying The Atari"
c/o Computer Shopper
P.O. Box F
Titusville, FL 32781-9990

PROGRAM 1

```
KLJ 30000 REM MULTI-LUMINANCE PROGRAM
KMJ 30010 REM BY JEFF BRENNER
CFJ 30020 RESTORE 30070:I=0
FHJ 30030 READ NUM:IF NUM=-1 THEN 30050
YDJ 30040 TOT=TOT+NUM+1:POKE 1664+I,NUM:I=I+1:GOTO 30030
RAJ 30050 IF TOT<>13108 THEN PRINT "ERROR-CHECK PROGRAM":STOP
HNJ 30060 A=USR(1664):RETURN
TTJ 30070 DATA 104,173,48,2,133,204,173,49,2,133,205,160,26,169,10
XPJ 30080 DATA 153,230,6,136,208,250,160,0,177,204,9,128,145,204,160
UKJ 30090 DATA 3,177,204,9,128,145,204,160,6,177,204,9,128,145,204
OBJ 30100 DATA 200,192,28,208,245,169,197,141,0,2,169,6,141,1,2
TPJ 30110 DATA 173,14,212,9,128,141,14,212,96,72,152,72,173,11,212
TBJ 30120 DATA 201,7,240,18,201,8,240,14,230,204,164,204,185,231,6
SBZ 30130 DATA 141,23,208,104,168,104,64,169,0,133,204,240,238,-1
```

PROGRAM 2

```
NOJ 10 REM MULTI-LUMINANCE DEMONSTRATION
MHJ 20 GRAPHICS 0:GOSUB 30000:RESTORE 50
EGJ 30 FOR I=1767 TO 1791:READ N:POKE I,N:NEXT I
OOJ 40 SETCOLOR 2,5,2:POKE 752,1
NZJ 50 DATA 4,6,8,10,12,14,0,0,0,0,0,0,0,0,0,0,0,0,14,12,10,8,6,4
KJJ 60 FOR I=0 TO 5:POSITION 19-I,I:PRINT CHR$(8);
DLJ 70 IF I<>0 THEN FOR J=1 TO I*2:PRINT CHR$(160);:NEXT J
JRJ 80 PRINT CHR$(10);:NEXT I
TYJ 90 FOR I=0 TO 5:POSITION 19-I,23-I:PRINT CHR$(138);
DBJ 100 IF I<>0 THEN FOR J=1 TO I*2:PRINT CHR$(160);:NEXT J
NMJ 110 PRINT CHR$(136);:NEXT I
UNJ 120 FOR I=1 TO 4:POSITION 16,(I-1)*3+7:PRINT "CHOICE ";I:NEXT I:CHOICE=1
EDJ 130 FOR I=1774 TO 1783 STEP 3:POKE I,0:NEXT I
NIJ 140 POKE 1774+(CHOICE-1)*3,14
DFJ 150 CONSOL=PEEK(53279):IF CONSOL=7 THEN 150
PRJ 160 IF CONSOL=5 THEN SOUND 0,100,10,8:CHOICE=CHOICE+1:IF CHOICE=5 THEN CHOICE=1
PPJ 170 IF PEEK(53279)<>7 THEN 170
CXJ 180 IF CONSOL<>6 THEN SOUND 0,0,0,0:GOTO 130
BJJ 190 PRINT CHR$(125):POSITION 6,5
RWJ 200 PRINT "YOU HAVE SELECTED CHOICE #";CHOICE;"."
ULZ 210 STOP
```

Space Tablet

Continued from page 53

chase the completed product from the retailer. "Programs are a lot more fun and relaxing to operate when you can sit back in a comfortable chair six feet from the computer and point or wave your hand" said Terrell, "moving chess players on a board, placing musical notes on a score, painting in space, pulling down menus, positioning characters in a scene, zooming in the "Z" dimension, flipping through a file drawer, exploding parts lists, controling mechanical arms in 3d on a production line to handling nuclear waste or having a sword fight with your computer at the end of a hard day's work seems natural enough to me."

The Space Tablet with Sampler diskette retails for $150 with interface to the Atari and Commodore computers, $175 interfaced to the Apple II, II+, IIe, IIc and IBM PCjr, $200 interfaced to IBM PC, XT, AT.

For information, contact Soniture, Inc. at 2146 Paragon Drive, San Jose, CA, 95131.

Mention that you read it in the **Computer Shopper.**

Advertising Deadline is the 2nd Monday of each month.

IBM CONTINUED

Media Master For Disks of Another Kind

by Andrew Fried

The CP/M "Standard"

Before the IBM de facto "standard" existed, CP/M was considered as a standard for tranporting software among different machines even though the machines themselves were very different. This was possible because only a portion of the operating system had to be customized for each individual machine while leaving the bulk of the operating system common to all.

Unfortunately, the disk system used to store these programs was not standardized. This meant that a program written for the Osborne could be run by a Kaypro; but only if the Kaypro could read the program in the Osborne disk format!

The Modem Solution

The first method used to circumvent this problem was thru the use of the modem; ASCII files were sent from one machine to another via direct connect modem; or to a bulletin board systems throughout the country. While this method was adequate for an occaional program, it was far from acceptable for numerous file transfers. The problem became more acute as the transportables (or luggables as the Osbornes were called) began to surface. For the first time, people were buying second computers for use while traveling between the office and home. Most of the portables operating under CP/M 2.2 not only ran the same programs as the desk top units but shared the same data files. Since many of these units were designed to augment the desk top, many sought easier methods of returning files from the portables into their desktop system.

When MSDOS programs emerged, many of the popular 8 bit programs were ported over to the new machines. While the CP/M programs would not run under MSDOS, most of the software retained identical data structures, allowing data files created under each operating system to be interchanged.

The Secret

You see, most computer systems utilize the same disk controller chip, the NEC 765. Unfortunately, even though the same chip is used, a myriad of different configurations are possible depending upon what parameters the operating system passes to the chip. Furthermore, different implementations of the disk itself resulted in major differences between the various manufacturers such as the location and size of the directory.

The logical solution to the problem was to develop a program that was able to reconfigure the controller chip and bypass DOS so that the disk drive could be told to read and write different disk formats under one operating system. One of the more successful and certainly one of the most powerful disk conversion utilities to appear is Media Master.

Media Master

Media Master is a menu-driven program designed to allow the IBM PC to read any one of 72 different disk formats; formats spanning a dozen or so operating systems and covering most major (and some not so major) disk formats. All the operator need know is that the format of the source diskette and optionally the format of the destination diskette. Media Master takes care of the rest.

How It Works

Media Master is simple to use. All you do is to call up the program and tell it what configuration you want for each drive; Media Master does the rest! Once a drive is logged in, any disk under the specified format can be read, files copied from or written to the disk, and blank disks can be formatted under a foreign format! When you run the program, you are prompted with the following options:

LOG IN a new diskette — This option is used to configure either drive A or drive B into any one of the foreign formats. You cannot reconfigure any other drives besided A & B but you can simultaneously assign one format to drive A and a different format to drive B .This is especially useful if you are doing program development work and trying to shift source code from machine-to-machine. After you select the drive specification, you must enter an already formatted disk into the drive so that Media Master can verify its format and locate the directory information.

FORMAT a diskette — Many programs similar to Media Master either leave this option out or charge extra for it. Using this selection, you can take an unformatted diskette and format it in any one of the 72 formats supported by Media Master.

COPY files — Using this option, you can copy files from one drive to another and from one format to another. Except for the designation of your source drive, you may copy the files to any drive from A to B. You are also permitted to use "wildcards" to transfer several files at the same time.

DISPLAY directory — Selecting this option allows you to view the directory on the drive and gives you space remaining on the disk.

ERASE files — Used to delete files from the disk.

TYPE a file — Sends an ASCII file to the screen for viewing.

OPTIONS menu — This option allows you to print a directory, print a file, create a subdirectory, change subdirectory, remove a subdirectory and toggle verify on write to disk.

EXIT to MS DOS — used to terminate Media Master and return to DOS.

Problems — I quickly discovered one minor problem with the program dealing with naming files. Many operating systems do not allow any characters beside A to Z and 0 to 9 for use with a filename. PC DOS does allow additional characters, for instance the '_' character. Used in lieu of a space, the underline is very often used in filenames. Unfortunately, Media Master prevented me from entering it as part of a files name which prevented me from accessing those files. Because Media Master supports wildcard characters ('*' and '?'), I was able to circumvent this problem by using a wildcard in place of the underline character.

One other minor annoyance was that the program defaulted to IBM SSDD Dos 1.1 format. Since very few machines still use that "primitive" format, I would have like Media Master to default to DSDD Dos 2.0 format automatically.

Supported Formats

Originally written in Aztec C for the Osborne, Media Master was ported into the IBM and released in December 1984. According to the President of MDG & Associates, Mark Grabill, the program consists of 140K of source code. The most recent version of Media Master designed for the IBM and compatibles (Version 1.11 dated 02/05/85) supports the following disk formats:

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CP/M

Public Domain Software

by Bill Chin

There are 6 new releases for the ardent CP/M users and 9 new volumes for the PC/MS-DOS users of personal computers.

The Sig/M Users Group library now is up thru 223 and is supplied on 8 inch single sided single density IBM 3740 type diskettes 241KB storage (and other formats thru local computer clubs) from the ACG-NJ. The costs are $6 per diskette shipment within the domestic USA area or $9 in US currency per diskette to overseas locations. These diskettes are obtainable from:

Sig/M Users Group
c/o Diskette Order
P.O. Box 97
Iselin, NJ
USA 08830-0097

NO COD's, collect or charge cards are accepted at ANY time. Membership is $14 in USA, and $27 overseas in US currency. For membership contact:

ACG-NJ
c/o Membership
P.O. Box 319
S. Bound Brook, NJ
USA 08880-0319

The PC-Blue Users Group is now up thru 110 and is supplied on 5¼ inch diskettes in 320KB storage formats from the NYACC. The diskettes cost $7 per diskette in the USA and $12 per overseas or foreign shipment per diskette.

PC-Blue volume 109 and 110 Multi-User RBBS-PC v12.3b from Capital PC Users Group 018 souce files disk - 110 systems files disk - 109

Sig/M Users Group

Newest Releases

This is the only remaining truly public domain. CP/M software library is now up to 223 diskette volumes of 8 inch diskettes (241kB storage). ●

```
module description
index   name              size    crc

contents of PC-Blue volume 110
        -CATALOG.110
checksum program
        CRCK4   .COM

Multi-User RBBS-PC v12.3b
110.01  ADLF    .BAS        1K   9F 06
110.02  CONFIG  .BAS       57K   4D 83
110.03  FILECOMP.BAS        2K   DB EB
110.04  RBBS-PC .BAS       50K   4D 50
110.05  RBBS-PC .DOC      174K   C9 9C
110.06  RBBSINIT.BAT        3K   25 A0
110.07  UNWS    .BAS        1K   3A A8
110.08  WATCHDG1.ASM        3K   03 BB
110.09  WATCHDG1.COM        1K   F8 FF
110.10  WATCHDOG.ASM        3K   30 6E
110.11  WATCHDOG.COM        1K   C0 85
110.12  WATCHDOG.DOC        3K   A8 DC
109.01  BDRIVEC2.OBJ        2K   F8 B5
109.02  BULLET  .           1K   34 11
109.03  BULLET1 .           3K   08 31
109.04  CONFIG  .EXE      103K   44 C4
109.05  DIR     .           1K   00 00
109.06  DIR99   .           1K   00 00
109.07  FILESEC .           1K   00 00
109.08  HELP01  .           2K   72 A0
109.09  HELP02  .           2K   CA 81
109.10  HELP03  .           1K   A6 B9
109.11  HELP04  .           1K   9C F5
109.12  HELP05  .           1K   5B D3
109.13  HELP06  .           9K   37 85
109.14  HELP07  .           2K   0A 8F
109.15  HELP08  .           1K   A0 7B
109.16  MENU1   .           1K   0A 64
109.17  MENU1G  .           1K   1A CD
109.18  MENU2   .           1K   73 4B
109.19  MENU2G  .           1K   73 4B
109.20  MENU3   .           1K   99 6A
109.21  MENU3G  .           1K   92 BC
109.22  MENU4   .           1K   52 AF
109.23  MENU4G  .           1K   FD 66
109.24  MENU5   .           2K   E9 4A
```

Continued on page 56

Public Domain Software

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```
109.25  MENUSG   .        2K  15 8C
109.26  NEWUSER  .        1K  00 00
109.27  PASSWRDS.         1K  00 00
109.28  PC-NET   .OBJ     1K  CC BE
109.29  RBBS-PC  .EXE   108K  97 B6
109.30  RBBSINIT.BAT      3K  80 9D
109.31  UTILITY  .OBJ     1K  8A 66
109.32  WELCOME  .        2K  4B 1E
109.33  WSDOS    .EXE    28K  17 09

PC-Blue volume 108
Miscellaneous MS/PC-DOS Utilities

Extended Disk Directory v5.4
dBASE Phone Utility
Time Keeper v1.4
Extended Batch Language v2.01b

contents of PC-Blue volume 108
        -CATALOG.108
checksum program
     CRCK4      .COM

Extended Disk Directory v5.4
108.01  XDIR54   .EXE    60K   4B E1
108.02  XDIR54   .LST    47K   C6 26

dBASE II TelePhone Utility
108.03  PHONE    .CMD     2K   47 64
108.04  PHONE    .DBF     2K   C3 7B
108.05  PHONE    .NDX     1K   C5 7C
108.06  PHONEADD.CMD      2K   C1 C7
108.07  PHONEEDT.CMD      2K   0C AF
108.08  PHONEGET.CMD      4K   A4 04
108.09  PHONEMAL.CMD      2K   3A 97
108.10  PHONEOUT.CMD      1K   7F E8
108.11  PHONESCR.CMD      1K   71 33
108.12  PHONEWS  .CMD     2K   38 61
108.13  READ     .ME      1K   98 CB
108.14  START    .CMD     2K   B9 C1

Time Keeper v1.4
108.15  ONTIME   .EXE    20K   B9 AE
108.16  OFFTIME  .EXE    20K   28 09
108.17  TIMEKEEP.EXE     31K   42 BD
108.18  TIMEKEEP.DOC      8K   46 6C

Extended Batch Language v2.01b
108.19  BAT201B  .COM    10K   F2 82
108.20  BATDOC   .BAT    38K   79 EC
108.21  BATDEMO  .BAT     9K   06 E0
108.22  BAT      .DOC     7K   4A B1
PC-Blue volume 107
Modem Communications Programs
Kermit version 2.26
QModem version 2.87E

contents of PC-Blue volume 107
        -CATALOG.107
checksum program
        CRCK4   .COM

Kermit version 2.26
updated release for MS-DOS use
107.01  MSKERIBM.EXE      83K 02 64
107.02  MSKERMIT.DOC     103K EB 8D
QModem version 2.87E
A Modem program with windows

107.03  QMODEM   .COM      64K B7 8D
107.04  QWINDOWS.COM       17K B7 D1
107.05  PCTQMD   .COM      13K 9E FA
107.06  PCTQMD   .DOC       4K 09 2B

PC-Blue volume 106
PC-Jr MODEM Communications Programs

PC-Talk III for PCjr
PC-Talk III version 5
IBMODEM modified for PCjr

contents of PC-Blue volume 106
        -CATALOG.106
checksum program
        CRCK4   .COM

Modified PC-Talk III for PCjr
106.01  JR-TALK .EXE     81K    A4 F5
106.02  JR-TALK .MRG      3K    26 D2

PC-Talk III version 5
106.03  CHDIR    .OBJ      1K   B2 29
106.04  DSK      .OBJ      1K   10 B0
106.05  GETDIR   .OBJ      1K   BE BC
106.06  PCTALK5 .BAS      52K   52 30
106.07  PCTALK5 .EXE      98K   7D B4

Modified IBMODEM for PCjr
106.08  JR-MODEM.BAS     16K    E8 5E
PC-Blue volume 105
Miscellaneous System Utilities

"Ultimate" Disk Utility
'JNIX Terminal Emulator
Compact Library Update Utilities
dBASE II/III Function Menu
Selection of Screen Attributes
Reminder Signal
Lease/Purchase Option
Incremental Backup BATCH Command
Protect/Unprotect File Utility

contents of PC-Blue volume 105
        -CATALOG.105
checksum program
        CRCK4   .COM

"Ultimate" Disk Utility
105.01  PC-SWEEP.DOC      24K  6F 24
105.02  PCSWP110.COM      33K  CA EF
105.03  READ     .ME       2K  83 62

UNIX type Terminal Emulator
105.04  SIMTERM .EXE     110K  F5 07
105.05  SIMTERM .DOC      34K  07 DF
105.06  MENUS    .         2K  61 F1
105.07  BOARDS   .SAM      1K  DB 65

Compact Library Update Utilities
105.08  LUU      .COM      2K  AE 97
105.09  LUU      .DOC      3K  D2 DB
105.10  LUT18    .COM      2K  54 83
105.11  LUT18    .DOC      1K  A0 A7
105.12  LUE      .COM      2K  13 A2
105.13  LUE      .DOC      2K  F5 34
dBASE II/III Function Menu
105.14  DOP      .DOC     11K  F3 79
105.15  DOP2     .PRG      9K  C6 28
105.16  DOP3     .PRG     10K  3B 9E

Selection of Screen Attributes
105.17  SETSCRN .EXE       2K  8E 75

Reminder Signal
105.18  SIGNAL   .COM      1K  2A EC

Lease/Purchase Option Program
105.19  LEASE    .BAS      3K  50 E8

Incremental Backup BATCH Command
105.20  AUTOBAK .BAT       4K  00 5D
105.21  AUTOBAK .HLP       1K  AE DC
Protect/Unprotect File Utility
105.22  PROT     .BAS      1K  52 F9
105.23  PROT     .COM      1K  56 B0
105.24  UNPROT   .BAS      1K  8D 05
105.25  UNPROT   .COM      1K  6D F8
105.26  PROTECT .DOC       2K  10 A1

PC-Blue volume 104
Miscellaneous Utilities

Incremental Backup Utility
Library Update written in "C"
Library Update written in BASIC
Window Pop-up Utility
Menu-Driven Disk Utility
RAM Disk Utility
Disk Patching Utility
Wordstar/ASCII Reformatter
Wordstar 3.0 Customization Notes
Hex Converter in MS-DOS
Page Mode List Program
Changing PC-DOS File Attributes
Redirection of Print Output to Disk

contents of PC-Blue volume 104
        -CATALOG.104
checksum program
        CRCK4   ,COM

Incremental File Backup Utility
104.01  IBU      .COM    10K  92 3B
104.02  IBU      .DOC    70K  C3 EE
104.03  IBUREAD .DOC      4K  9D 23

Library Update written in "C"
similar to LU - library utility
104.04  GRABBAG .C       10K  82 80
104.05  GRABBAG .EXE     16K  23 FE

Window Pop-Up Utility
104.06  PCWINDOW.COM     22K  06 39
104.07  PCWINDOW.DOC      1K  A9 3F

RAM Disk Utility
104.08  MBRAIN   .DOC     4K  CD 2A
104.09  MBRAIN   .EXE     3K  58 1C

Diskette Patching Utility
104.10  PATCH    .COM     5K  18 9A
104.11  PATCH    .DOC    10K  6B E4

Wordstar <--> ASCII Reformatter
104.12  WSCONV   .BAS     8K  50 FD
104.13  WSCONV   .EXE    27K  EB 9F

Library Update written in BASIC
104.14  LUPC     .BAS    23K  CF BE

Wordstar 3.0 Customization Notes
104.15  WS30     .DOC    14K  30 96
Menu-Driven Disk Utility
104.16  AUTODEX .EXE     32K  60 CC
Hex Converter (MS-DOS)
104.17  HC-MSDOS.COM      4K  FC 8A

Printing Page Mode Listing Program
104.18  LIST5    .COM     3K  CA 04
104.19  LIST5    .DOC     7K  96 85

Changing PC-DOS File Attributes
104.20  CHMOD    .DOC     2K  11 F1
104.21  CHMOD    .COM     1K  2F 27

Redirection of Printer Output
 04.22  FSPOOL   .COM     5K  E5 D2
 04.23  FSPOOL   .DOC     3K  0F E6

 Sig/M volume 223
 RESOURCE Disassembler for CP/M 86
 utilities for NEC APC computer
 label program

PC-Blue volume 103
Various  Pascal Games and the Third
Dimension 3D Graphics Generator

contents of PC-Blue volume 103
        -CATALOG.103
checksum program
        CRCK4   .COM

Various Pascal Games
103.01  TELEPHON.PAS      5K  B9 1A
103.02  BACCARAT.PAS      7K  01 E8
103.03  BJGAME   .PAS    10K  79 A2
103.04  BLACKBOX.PAS      8K  73 8B
103.05  BLOCK    .PAS     9K  AD A1
103.06  BOGGLE   .PAS     4K  F9 B0
103.07  CHUCKLCK.PAS      4K  AE DA
103.08  HORSERAC.PAS      5K  2A 39
103.09  ARTILLRY.PAS      3K  57 B9
103.10  DODGE    .PAS    12K  98 64
103.11  MAKEFILE.PAS      2K  BA C7
103.12  LANDINST.DAT      2K  24 E2
103.13  GUESSIT .PAS      3K  3A 84
103.14  LANDER   .PAS    10K  51 BD
103.15  HANGMAN .PAS      5K  C2 54
103.16  NUMCNVRT.PAS      5K  93 E3
103.17  KENO     .PAS     5K  6F D4
103.18  KISMET   .PAS    11K  85 4B
103.19  OVERUNDR.PAS      4K  CE EB
103.20  PASCAL   .PAS     3K  B4 99
103.21  SNAKE    .PAS     7K  AE DA
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Media Master

Continued from page 55

Actrix (DSDD)
Actrix (SSDD)
Avatar TC10 (DSDD)
Casio FP 1000 (DSDD)
Chameleon CP/M-80 (DSDD)
Columbia MPC CP/M-80 (DSDD)
Cromemco CDOS (SSDD)
Cromemco w/Int'l Term (DSDD)
Cromemco w/Int'l Term (SSDD)
DEC VT180 (SSDD)
Davidge (DSDD)
Digilog (DSDD)
Epson Multifont (DSDD)
Epson QX-10 (DSDD)
Fujitsu Micro 16s (DSDD)
Groupil III CP/M (DSDD)
H/Z Z100 CP/M (DSDD) - Later
H/Z Z100 CP/M (SSDD)
H/Z Z100 Z-DOS 1.1 (DSDD)
H/Z Z100 Z-DOS 1.1 (SSDD)
H/Z Z100 Z-DOS 2.0 (DSDD)
H/Z Z100 Z-DOS 2.0 (SSDD)
H/Z Z90 40 trk 1k blk (SSDD)
H/Z Z90 40 trk 2k blk (SSDD)
Heath w/Magnolia CP/M (SSDD)
IBM PC CP/M-86 (DSDD)
IBM PC CP/M-86 (SSDD)
IBM PC-DOS 1.xx (DSDD)
IBM PC-DOS 1.xx (SSDD)
IBM PC-DOS 2.xx (DSDD)
IBM PC-DOS 2.xx (SSDD)
IDEA Bitelex (SSDD)
ISM CP/M (DSDD)
Insight Dev. IQ-120 (SSDD)
Kaypro 2x,4,10 (DSDD)
Kaypro II/2 (SSDD)
LNW-80 (SSDD)
Lobo Max-80 (SSDD)
Lobo Max-80 512 (SSDD)
Micral 9050 CP/M-80 (DSDD)
Morrow MD 11 (DSDD)
Morrow MD 2 (SSDD)
Morrow MD 3 (DSDD)
NCR Decision Mate 5 (DSDD)
NEC PC-8001A (DSDD)
NEC PC-8001A (SSDD)
Olympia ETX II (SSDD)
Olympia EX100 (DSDD)
Osborne (SSDD)
Osborne 4 (DSDD)
Osborne Osmosis (SSDD)
Otrona CP/M (DSDD)
PMC Micromate (DSDD)
Reynolds & Reynolds (SSDD)
Sanyo CP/M (DSDD)
Superbrain (DSDD)
Superbrain Jr. (SSDD)
Systel II (SSDD)
Systel III (DSDD)
TI Professional CP/M-86 (DSDD)
TRS-80 FEC CP/M (SSDD)
TRS-80 FEC T805 (SSDD)
TRS-80 III Hurr. Labs (SSDD)
TRS-80 III w/Mem Merch (SSDD)
TRS-80 IV CP/M + (SSDD)
TRS-80 IV Mont. Micro (SSDD)
Teletek 40 trk (SSDD)
Toshiba T100 (DSDD)
TurboDos (DSDD)
Wang Maws CP/M (DSDD)
Xerox 820 II (SSDD)
Zorba 40 trk (DSDD)

Hardware Requirements

Media Master has relatively few hardware requirements for the IBM PC version. The minimum system configuration consists of a PC or XT, DOS 1.0 or later, 128K of memory, one DSDD disk drive and one of the following:

Another floppy disk or
A hard disk or
A RAM disk greater than 128k bytes.

According to MDG & Associates, Media Master has been tested in the following compatibles: Chameleon, Compac, Compac+, Compaq DeskPro, Corona, Eagle Spirit, Kaypro 16, Leading Edge, Panasonic Sr. Partner, Sperry PC, Televideo, Zenith Z150, AT & T 6300, NCR Decision Mate 4, and the Tandy 1000 and 1200 (must have at least 256K RAM).

Conclusion

Disk conversion utilities certainly aren't for everyone. If you use only one machine and rarely need to transfer data to or from other machines, you would probably never need such a program. On the other hand, if you do use other machines, engage in software development work or exchange disks with others having incompatible disk formats, Media Master is an absolute must.

Don't let the low price fool you; Media Master is a $200 program that happens to sell for only $39.95. That may explain why MDG has sold almost 10,000 copies of the program! It is well documented and does not employ copy protection of any kind. My copy of the program performed flawlessly without the need for any type of installation.

In addition to the version for the IBM PC and compatibles, Media Master is available for the following machines:

Dec Rainbow 100
Kaypro II/2
Osborne I (DD)
Osborne 4
Osborne Executive
Osborne Vixen
(Version for the Zenith Z-100 soon to be released.)

For more information contact: MDG & Associates, 4573 Heatherglen Court, Moorpark, CA 93021, Phone (805) 529-5073. ●

Triple Threat Freeware: PC-Write, PC-File And PC-Talk

Part II

by Hal Nieburg

Last month, we introduced PC-Write, the fastest word processing system available for the PC! Its capabilities were demonstrated and we showed how to perform the standard ABCs of word processing, including block editing, windows, multiple memory buffers and so on. In this piece, we will look at printing and formatting, and then introduce the second part of the triple threat, PC-File.

Some of the best software around, available for the asking? Yes, indeed, and freeware has advantages over both licensed and public domain software. It is miles ahead of the latter and beats much of the former at any price. And, most important, it does not have to be paid for until it has proven itself in use.

The freeware concept tells us something we like to hear: that we are trustworthy and decent human beings! That we deserve to make our own judgments about software and about our obligations to the authors. Nothing inspires reciprocity so much as an uncoerced act of trust and generosity!

Copyrighted and wholly professional, yet under an enlightened and humanistic concept, it can be copied and given away, and often is available for down-loading on network bulletin boards.

Configuring PC-Write

The installation parameters are in a file called "ruler.def." The program can be tailored for monochrome or color/graphics boards, and for any kind of monitor.

First, bring up the file with the Ed command. If that doesn't work, it probably means that the definition file is set wrong for your configuration. The situation is not hopeless. Change the name of the ruler.def file, so that the edit program will not try to open it. Now the re-named file will load in a vanilla form, and can be edited. It can be returned to the correct name later.

At the top of the file is the ruler line. Default tabs and margins can be reset as desired. Under the rule is a "%C" line, which installs color for an RGB or compositive screen. To edit for monochrome, simply add a + sign in front of "%C," and save to disk. Now change the name back to "ruler.def" and reboot the computer. It will boot correctly for a monochrome board, with all parameters intact for formatting and printing. What you have done is simply disable the color installation command; but it remains in the file, so to be changed back to color in the future.

By editing the ruler at the same time, much-used margins and tab stops will always be set for subsequent editing sessions. Here an inventive and original feature appears: whenever PC-Write is booted, it first looks for a default ruler file with the same extension as the name of the text file to be edited. So a wide variety of installation files can be concurrently on the master editing disk.

To choose specially-tailored defaults, give the text file the correct extension. When Ed is loaded, it looks for a ruler with an extension that matches the extension of the file specified. If one is not found, it reverts to

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TANDY COMPUTERS

Tallymaster, Interactive Financial Analysis Program

by Richard Burckhardt

Tallymaster, the Interactive Financial Analysis Program, is another creation of Chuck Tesler, who gave us Newscript and Allwrite. Categorizing it is somewhat difficult. It isn't exactly a spreadsheet, nor is it a ledger. It's sort of a hybrid mixture of the two. If offers some of the analysis capabilities of some of the more popular spreadsheets and is much easier to use, but certainly can't match the versatility of Visicalc or most of the newer spreadsheets for the TRS-80.

Tallymaster comes on a single diskette and includes instructions for copying the files to your own system diskette. The documentation comes in an attractive vinyl three-ring binder and is first-class all the way. Tesler wrote the manual as well as the software and came up with one of the finest pieces of software documentation I've seen. The content is easy to understand and the text is printed (as in typesetting) so it is easy to read. You won't find xeroxed dot-matrix pages here.

You can also use on-line documentation with the <H>elp command which is at the top of the main menu. You really need to be reasonably familiar with the program to use this information, though. I tried using the program with only the on-line documentation prior to reading the manual. It doesn't work too well. I suppose with enough trial and error, you could figure out what you are doing, but read the manual first. It's only 98 pages long and includes lots of valuable information and illustrations.

Rather than giving you rows and columns to work with, as in a spreadsheet, Tallymaster gives you a series of worksheets. You can move from one worksheet to another using the left and right arrow keys. Each of the 27 worksheets will hold 26 categories, giving you a total of 702 categories. Each category has a one- or two-letter identification, a name and an amount. The categories are set up as A-Z, AA-AZ, BA-BZ, etc., with the first screen, A-Z, generally used as the front page listing all of the major categories and their totals. The sub-categories, AA-ZZ, are used for breakdowns of each of the categories, such as different expenses under the main category of Expense.

To define the categories, you simply go to the "page" you wish to use and type in the category ID and a name at the prompt at the bottom of the screen and hit <ENTER>. The category will then show up on the screen. To enter amounts, you simply type the ID and the amount. The figures on the screen are automatically updated.

The main menu (see picture) offers 12 options, most of which are clear to the user. Some of them are a bit confusing without first reading the manual. The MATH AND MOVE function, for example, seemed strange and mysterious to me at first glance. It's not really. This function offers a

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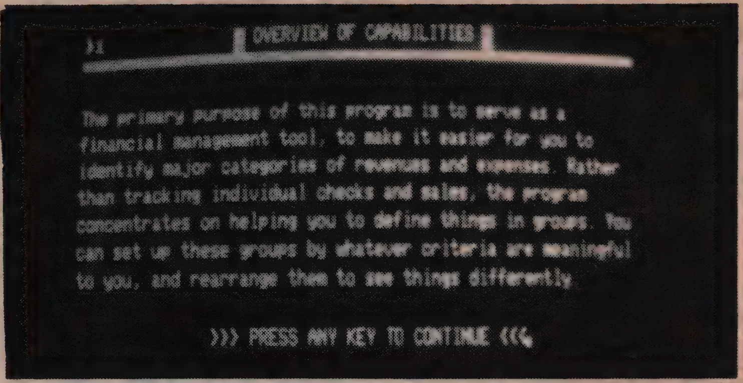
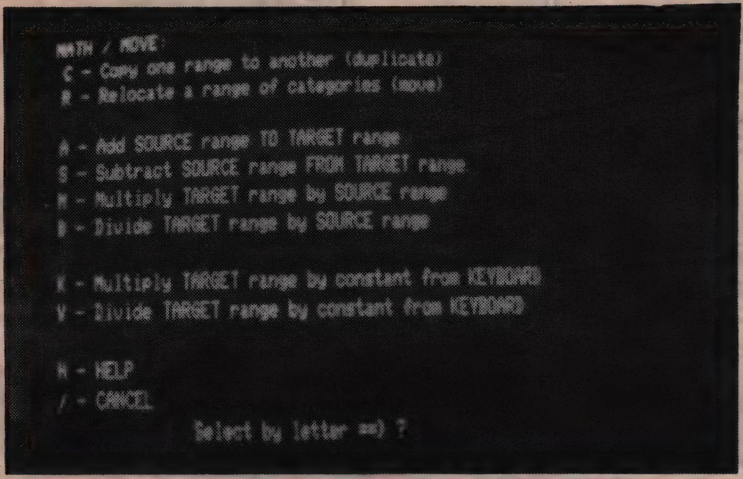


```
>1                OVERVIEW OF CAPABILITIES

The primary purpose of this program is to serve as a
financial management tool, to make it easier for you to
identify major categories of revenues and expenses. Rather
than tracking individual checks and sales, the program
concentrates on helping you to define things in groups. You
can set up these groups by whatever criteria are meaningful
to you, and rearrange them to see things differently.

              >>> PRESS ANY KEY TO CONTINUE <<<
```

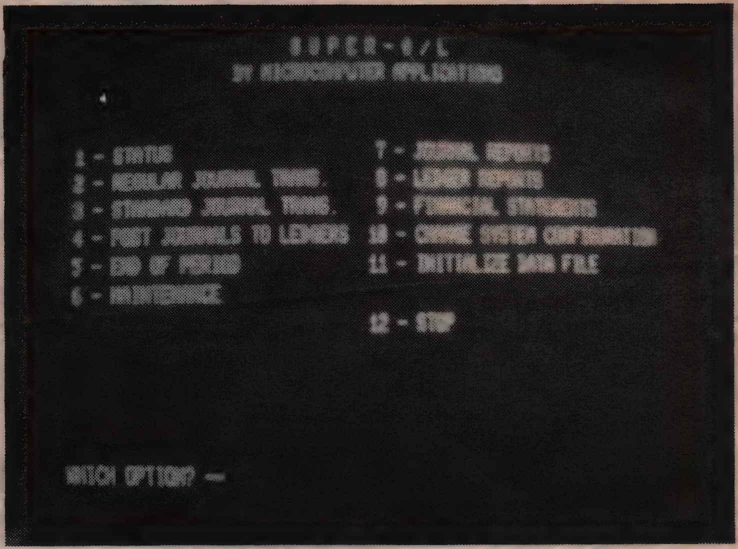


```
MATH / MOVE:
 C - Copy one range to another (duplicate)
 R - Relocate a range of categories (move)

 A - Add SOURCE range TO TARGET range
 S - Subtract SOURCE range FROM TARGET range
 M - Multiply TARGET range by SOURCE range
 D - Divide TARGET range by SOURCE range

 K - Multiply TARGET range by constant from KEYBOARD
 V - Divide TARGET range by constant from KEYBOARD

 H - HELP
 / - CANCEL
              Select by letter ==> ?
```



```
                     SUPER-G/L
              BY MICROCOMPUTER APPLICATIONS

1 - STATUS                      7 - JOURNAL REPORTS
2 - REGULAR JOURNAL TRANS.      8 - LEDGER REPORTS
3 - STANDARD JOURNAL TRANS.     9 - FINANCIAL STATEMENTS
4 - POST JOURNALS TO LEDGERS   10 - CHANGE SYSTEM CONFIGURATION
5 - END OF PERIOD              11 - INITIALIZE DATA FILE
6 - MAINTENANCE
                               12 - STOP

WHICH OPTION? —
```

Super General Ledge (G/L)

by Richard Burckhardt

Super-G/L is a general ledger and client write-up system produced by Microcomputer Applications, a husband and wife operation out of Salem, Oregon. It is the second program in a series of "Super" programs from the company, the first being Super-P/R, a payroll system released in 1983.

It takes a lot of guts, as well as time and patience, to go into a start-up business in computers these days, so I have to admit that after reading the introduction to the manual, I was pulling for the couple, Doug and Anita Walker, to impress me.

The program comes with a vinyl three-ring binder with xeroxed, dot-matrix documentation. The binder is not a custom job, just one with a clear cover and a page stating the program title slipped inside. Although the documentation is nothing fancy, it is written fairly well and includes a number of illustrations. It assumes at least an elementary knowledge of accounting.

The program comes on a single disk complete with the TDOS operating system. If you prefer, however, it is TRSDOS 1.3 compatible so you can move it to another compatible operating system. A data diskette with sample files is also included.

Super-G/L requires 48K and two floppy drives or a hard drive to operate. As you will see shortly, a printer is an absolute necessity. The manual shows the capacity of a standard Model III data disk as 2,124 transactions. The Model I maximum is considerably smaller - 680 on a 35 track single density disk and 880 on a 40-track single density data disk.

After taking you through TDOS backup procedures to set up a working diskette, the manual takes you into the program through use of an AUTO file which automatically boots the main menu from a reset. The first thing you see on the screen is a Microcomputer Applications logo and a filename prompt. After entering the name of the current file, such as GLMAY.DAT for the general ledger entries for the month of May, you are taken to the main menu (see photo).

Most of the options are fairly obvious, but before you do anything else, you have to use option 11, Initialize Data File, to tell the program such things as your company name, the maximum size for your file, the number of departments (sub-accounts) and where to store your data. On a two-drive system, it would be drive 1.

If you change your mind about initializing the drive, <@> will take you back to the main menu. In fact, <@< will take you back to the main menu from any point in the program.

It is also at this point that you will set up the maximum number of what Doug calls Standard Transactions, which are recurring transactions which can be set to automatically post each month.

Next, you will need to use the Company Maintenance option to set up accounting periods (up to 13), report titles, department numbers (up to 54), accounts and financial ratios. The accounting periods, usually months, are extremely easy to set up. You just type in the start and end of each. If you want to check on what you've done later, the Status option can be used. Along with the current period and fiscal year, it shows you how many accounts, departments, standard journal entries and transactions you have allocated and used.

The report titles are just typed in as well. In fact, if you aren't real picky about what your reports are called, you can just hit <ENTER> and use the default titles which are the usual titles such as Balance Sheet, Income Statement, etc.

Account numbers are eight-digit numbers with a decimal before the final two numbers.

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AIDS PLUS

for the Model I/III/4

Review by: Lon Andrews

This is an old love story for me. We have used the AIDS Data Base Manager since it was first introduced. At that time you had to go into the BASIC program and change the program lines to set up fields for the data base. It was cumbersome, slow, poorly documented (at first) and it worked. We managed many programs on the old AIDS. Spent many long hours using the various sub routines that were necessary to its operation. MAPS, CALCS and AIDS were tossed around unmercifully. We discussed, and cussed it over many cups of coffee. If you are a user of the old program you are aware of the frustration of forgetting the "*" to close out a file and losing everything.

There was a promised update of the program. We ordered this package and got a preliminary version. Meanwhile the old version was published. All you had to do was type it in and you had it all. Apparentley there was some changing hands of companies, etc. Too much to keep up with so I quit. Back to an older, tried and proven Data Base Manager.

A few months ago after some correspondence I finally obtained a copy of the new AIDS PLUS from SofTrends. After reading some nice words from the company I booted up the program and ZAP right back in love again. No more garbage collection! It keeps up with our fastest typist. No more BASIC program. Now it is machine language, menu driven and fast!

AIDS PLUS is called an information utility by SofTrends and any attempt on my part to explain the entire operation would take up a large chunk of this issue. "AIDS PLUS provides you with the capability of entering, organizing, isolating and reporting facts — transforming data into information." (From the AIDS PLUS manual) AIDS PLUS runs on most common DOS' used on the Models I/III.

One of the best features of the program is the sort capability. Multi level sorts are easy, straightforward and fast! Records can be marked individually or by class for printing, filing or deletion.

Printing of reports or forms is super easy. You can use a format provided by the program or establish your own by entering the EDIT text feature. There is a miniature word processor built-in to the program so you can develop form letters based on the records in the data base. It will handle 16 lines of 63 characters. A little practice and you will be producing professional looking form letters or reports. No need to interface with a separate word processor. It is all right there waiting to be used. If you want to go beyond the capabilities of the text editor you can still use the regular word processors to access the AIDS PLUS files for form letters. Mailing labels are a snap with the built-in form line editor.

If you have files from the old AIDS program they can be used with the new program. We managed this change over very painlessly. The hardest part of the change was to convince the operators that it is just as easy to use as it says.

Filename extensions are important when using AIDS PLUS. Use the extensions suggested in the documentation and a gain in the prompts inside the program. Each option that you select in the program is keyed to the documentation by page number displayed in the corner of the screen. This takes the pain out of looking up a reference. If that isn't enough there is a well written HELP file to help you while you are in the program.

The BREAK key isn't what it used to be in AIDS. It is used to move back and forth in the program. It usually produces the main menu. There is also a new routine called FLAWS- FLash-Annunciated Warning System. Hit a wrong key, pick the wrong option, type too many characters, leave the program unattended too long and the entire screen flashes. No way to miss it.

There are three steps to follow when using AIDS PLUS. (1) Define the system. Just like the other data bases you specify field name, length and type of field for each field you are creating in the data base. Once this has been done and saved you recall it each time the data base is booted up for use. This file is the System Descriptor File (extension /DSC). (2) Enter and manipulate data. This file when saved has the extension (DAT). (3) Exit AIDS PLUS. When you exit you are prompted to save any data file and descriptor file necessary. It is hard to leave the program improperly if you follow the prompts.

The documentation is complete and very well written. It comes in a spiral bound half sheet size notebook with 153 pages of information and guidelines. The program is supplied on a single density 35 track diskette. If you are using Model III the files must be converted. The conversion is done by booting your DOS (with all unnecessary files removed) in Drive 0. Put the program diskette in Drive 1. From DOS ready type "9", "ENTER" and the files will be transferred. When finished make sure all the files have been moved to your disk. A complete list of the files and their functions is given in the docs. Make some copies to save yourself time and trouble later on.

AIDS PLUS is a CMD file and can be booted from DOS ready. A menu will appear with the options to use an existing system, modify an existing, create a new system or quit. These options are straightforward with no surprises. Defining a new system is painless. First name the new system. This name is not necessarily the filespec. The program asks "Which field?". This is answered with a letter ("A" being field #1). The field name is given next followed by type of field (either Character or Number). Field length in characters has to be provided and last the number of digits to

Continued on page 112

TEXT PRESS

A Text Archival System TRS 80 Model 1 and 3

If you have a program or type of program you would like to see reviewed drop me a note in care of the COMPUTER SHOPPER and let me know. At the present time I am looking at several data base management programs. I would welcome some input from our readers to provide insight into what you want to read here in the COMPUTER SHOPPER. I have enjoyed the letters from our readers in the past 8 months. Please keep in mind that I can't answer your letters unless you provide a return address.

Review by Lon Andrews

TEXT PRESS is a program designed to compress your word processing files for storage so they take up 30 to 40% less disk space. If you do a lot of word processing the value of this program is apparent right off the bat. I have disk after disk full of files that I don't want to get rid of as I will use them again at some later date. If you are like me you won't need a file until the day after you have erased it to make some room for something else. I think that a variation of Murphy's Law must apply to this phenomea.

Files that are in ASCII can be compressed and then when-needed TEXT PRESS will decompress the file, returning it to the original form. It will run on TRS 80 Models I, III and 4 (in the III mode). Requiring at least 48K and one drive, the program has been tested on TRSDOS, NEWDOS, LDOS, and DOSPLUS.

According to the documentation TEXT PRESS (TP) will:

a. Save 30-40% on disk storage for most files.

b. Compress text files of any length.

c. Compress text files at the rate of 100 characters a second and decompress them several times that fast.

d. Compress or decompress from 1 to 25 files in a single program run.

e. Let you tailor the compression procedure to suit your needs.

f. Work on text files created by almost any word processing system.

TP uses the repetitiveness of the English language to allow it to compress files. "There are many words, like 'where,' 'the,' 'here,' 'that' and so on that are used frequently in any written material. Some 'trigrams' (groups of three letters) are used frequently, like 'ion,' 'ent,' and 'ing.' Likewise, some letter pairs, like 'th,' 'er,' 'ea,' 'he,' and 'at' are used much more commonly than others."

Magnetic storage of text data uses one byte of storage for each letter, numeric digit, space or other symbol. Each trigram requires three bytes and a pair uses two bytes. Each word uses as many bytes as there are characters in that word. The documentation uses the word "antidisestablishmentarianism" as an example of 28 bytes of storage.

How It Works

TP replaces multiple-byte words, trigrams and pairs with a single-byte token. Each time the replaced "word" appears in the text the token byte is substituted in its place. If the replaced "word" is a trigram the condensed version uses only ⅓ of the space the original required.

127 one-byte tokens have been set aside and paired with a "word." When you compress a file the program searches your file for the "words" and replaces them with the tokens. When the file is compressed it is written to a new storage location along with an index of the replaced words. This index is used during recompression to allow replacement of the tokens with the original words.

A sample of 135,000 characters of texts was analyzed to determine the most commonly used letter pairs. This formed the basis for the list of 127 pairs to be replaced. This list is an integral part of the program and cannot be changed without modifying the program. When the program is run 26 words are added to the list replacing 26 letter pairs from the list. Using this method the user can modify the list to his/her own individual use. Up to 127 words can be added to the list replacing the 127 letter pairs the authors have included.

The program is supplied on a single density 35 track disk without an operating system. Either COPY or CONVERT the program depending on the type of computer and DOS you are using. There are three files common to all DOS' and a special loader file that must match your DOS. Be sure to

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MISCELLANEOUS

How To Buy And Sell Used Computers

by Stan Veit

How Much Should You Charge, Or Pay?

The most important question in any transaction is how much? When you are considering buying or selling used equipment you want to know how much you should pay for the item or how much you should offer to sell it for. The answer to both sides of this question is always "fair market value,"but how do you find out what is "fair market value." In the stock market, or in commodities markets there are published quotations of market activity upon which you can judge the current market price of whatever is listed. Our sister publication *shutterbug ads Photographic News* provides the same service for used and collector's cameras by providing the "SA" quality standards.

Unfortunately there are no such standards for used computers. Therefore if you use the prices people are selling used items for in our classified ad pages, you have no way to compare quality, or even the configurations of each computer. There is a need for standards for both pricing and quality of used computers. Computer Shopper had hoped to supply this information in a book form, but the rapid growth of this magazine has prevented us from working on the project. There are now two other sources for pricing information on used computers and peripherals available and I will discuss both of them in this installment of this article.

Before getting into the discussion of pricing standards, I would like to discuss the concept of preceived vs. actual value. To illustrate this difference in value I will use cameras for an example. Any used item depreciates in value over the years. My Nikon FTN camera that I bought in 1972 and used since then has declined in value because newer models have come out with improvements and less weight. If I wanted to sell it I could not expect to get 50% of its orignal cost. That is real value.

Once many years ago I owned a Nikon S Rangefinder camera. After many years of use I traded it in, plus a lot of money for a newer camera. If I had my Nikon S camera in the same condition today it would be worth many times what I sold it for because it is a collector's item - that is preceived value.

The collection of antique computers is in its infancy, there are few collectors active in the market, but we do know that certain computers will become very valuable in the future. The original Altair in working condition is a classic and a collector's item right now. The IMSAI and SOL SWTPC 6800s are less valuable, but in the future working units will be classics. Right now, Apple I computers are rare and much sort after, so are Scelbi 80008s, Micro 8s, and a few more old and rare computers. The rest are still just "used computers" which may, or may not become antiques in the future. Some wealthy collector may just decide to collect digital group "Brown Boxes" and bid the prices on them to levels beyond their actual value but until then who knows what their value is?

One more thing that effects the current price of used computers is the present value of the new models. For example, an Atari 800 computer with 16K RAM originally cost $750 in 1983. It is quoted at $220 retail, (used) at this time. Who would buy this computer for $220 when they could buy a brand new Atari 1200XL for $119 or less in any mass market store? Therefore we must make the assumption that it is actually worth the price that someone would pay for it now, which is about $50 to $75. At that price people will not even make the effort to sell, so they will just throw it into the closet and forget about the old Atari. Some day the old Atari 800 will be dug out and contributed to a charity sale for a $300 tax write off. Then it will sell at the Bazzar for $50 and eventually be thrown back into someone else's closet. Time will pass and the old Atari will be discovered and sold at auction for $1000, as an antique!

At this time there are two publishers of Used Computer Prices, the Orion Research Corporation who publishes the Orion Blue Book and Brown Book Inc. who publishes the Brown Book Industry Pricing Guide. Both these volumes are intended for the use of dealers and other professionals in the computer industry, not the general public. Other interested parties who subscribe to these information sources are insurance companies who insure people against loss and banks and finance companies who need a standard source of value for loans.

Some readers claim that the only true valuation source of information is Computer Shopper magazine because here the prices are the result of actual offerings. In spite of the many pricing sources, it is still hard

Continued on page 106

Renewing Assembly Language

Universal Machine-Independent Assembly Language

by Robert Fitz
and Larry Crockett

For all the celebrated features and merits of this or that new high level language, assembly language is still considered by many to be the best solution to programming problems where speed is important and the full use of the microcomputer's capabilities is desirable. Moreover, assembly language study and programming remain one of the best ways to learn how computers work. It is sometimes observed on college compuses, for example, that learning assembly language is a student's first genuine encounter with computers.

Yet there are problems with assembly language (AL), both in terms of its use and study. Incompatibility between different assemblers remains a major headache. Study of specific assembly languages, tied as it usually is to particular microprocessors, is limited in its ability to impart a general knowledge of AL.

One way to attack both of these problems is to develop an AL which is independent of any microprocessor. A genuinely universal, machine-independent assembly language, because it is not restricted to one particular computer and its idiosyncracies, lends itself especially well both to programming and to learning about programming and computers. In this article, we will look briefly at some of the disadvantages and advantages of assembly language and we will introduce the concept of a universal, machine-independent assembly language which possesses the advantages of both traditional AL and high level languages. We are convinced that universal, machine-independent AL will play an important role towards the renewal of interest in assembly language.

The Oldest Language and The Newest Computers

Assembly language was the first symbolic language used to program computers. For a number of years, in fact, it was the only language other than machine language. The development of FORTRAN in the 1950s was followed by many other languages which often took advantage of new technology and better understanding of programming. Some people concluded that the advent of these new languages would be AL's demise. But the obituary was premature. The speed, compactness and versatility of assembly language proved consistently appealing. For example, one of the widely reported "advances" of the Macintosh over the original Lisa is that the Macintosh's programs and subroutines were written in AL rather than Pascal.

The Disadvantages of Traditional Assembly Language

Many people believe that AL's disadvantages outweigh its advantages for all but the most hardware related programming tasks. Let's examine some of the disadvantages of what we will call *traditional* (in contrast to the proposed universal, machine-independent) AL. The next section will look at traditional assembly language's advantages.

Standardization: Even though the "standards" of high level languages (HLL) such as Pascal have been eroded by various extensions, a HLL can be learned and used with little concern for the idiosyncracies of particular microprocessors. In fact, HLL translation problems result more from versions of the language than from differences in the microprocessors which support the HLL. Consequently, many HLLs are relatively computer independent.

Traditional assembly language, on the other hand, doesn't even pretend to reflect a standard. Each microprocessor uses a different AL which is defined by the manufacturer. In some cases, the AL's instruction set is bloated with redundant, needlessly complicated instructions whose only evident purpose is to make the microprocessor appear more powerful than it is.

Portability: Owing to relative degree of standardization, programs written in high level languages such as Pascal or BASIC possess a measure of portability. Extensions complicate the portability but, the fact remains, it is usually possible, with a limited amount of effort, to port programs from one version of a high level language to another. Again, the portability question is often not microprocessor-specific but is a matter of portability across different HLL versions and which versions of a HLL are available for which micros.

Since each AL dialect reflects the specific features of the micro for which it was

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Snake

Review by
Karl H. Meyer

You wake up in a cold sweat, your heart pounding from the fright of the nightmare that had snakes chomping after you as you ran through the woods trying to reach targets before the snakes snatch them from you. Most frightening was the realization that you were a snake, and the computer snakes weren't playing by the same rules! You press Enter, and challenge them one more time.

You and the computer snakes are racing to swallow the targets, your tails growing longer and longer. You know you will die if you run over your own tail or a computer snake, while the computer snakes have no such restrictions; they run over you with impunity.

"Unfair!" you yell, and dart to the left to avoid running over one of the slinky little pests. Just as you are about to open the cage and grab your prize, it disappears from view! Five or six other prizes are scattered about, and you desperately attempt to avoid the computer snakes and your own tail to reach the target with the highest value. You swerve right, then left to avoid one of the racing beasties, dodge your own growing tail, then slam into the wall and die.

John Chenault's **"Snake!"** is a fast-paced arcade game for a monochrome IBM PC, which states frankly, "Warning! This may prove addictive!" It is extremely addictive, so addictive that you are provided with a method to stop action and blank the screen. At any time during play you may hit the 'B' key to hide the screen; hitting it again returns you to DOS. Chenault calls this the "Boss" key, and no great amount of imagination is needed to know why.

Three versions of the game are included on the disk. You may play solo, against another player, or against the computer, on ten different levels. A one-player game at level 1 (slowest and easiest) will prove to be excruciatingly slow to any gamester, and level 10 will frustrate the best of them. Scoring is based on the value of targets within boxes of varying sizes; entering the box through the gate scores double; from the back the score is normal, while hitting the box from either side removes points. However, if you think your reflexes are good, hit the box on the side and turn immediately upon contact, and you score double. It's difficult at level 1, and nearly impossible (for me) at level 10.

The program keeps track of scores, and displays high scores for the level used, and the length of your snake. No matter how many have played, it also keeps track of your personal high scores, so you aren't intimidated when you play the game after a whiz like my daughter.

There are essential differences in the game as played by one or two people, and one person against the computer. The one-player game requires you to avoid your growing tail and the walls as you attempt to grab the targets. The two-player game rewards you for forcing your opponent to chewing off a piece of your tail; not only do you receive extra points, but your shortened length is an asset in maneuvering around the screen.

Documentation is brief but thorough, and the packaging by Simon & Shuster is excellent. Because the disk is sealed into a poly sleeve, you don't need to be concerned about buying a program that has been used extensively in the store for "demo" purposes.

Arcade games for the IBM-PC are usually in color, leaving the monochrome users out in the cold. **Snake!** makes the monochrome machine an excellent vehicle for staying up all night while you are transported into a snake pit, transformed into a snake, and transmitted into a world where fast reflexes are required for survival. This game is easy to learn, but difficult to master.

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How Do I Remember Thee? Let Me Count The Ways

by L. Van Delray

There are three basic hardware elements making up a computer — the CPU, the memory, and the I/O. Although there are other types of memory, this particular column will touch upon the fundamentals of semiconductor memory elements.

There are two basic types of semiconductor memory used in a microcomputer system — volatile and non-volatile.

Volatile memory, called RAM (Random Access Memory), as the word volatile implies, loses any data stored within it when the dc operating power is removed. On the other hand, non-volatile memory, called ROM (Read Only Memory) retains its stored data when powered down.

Also, there are two basic types of RAM — static and dynamic, and ROM comes in several variations. Both RAM and ROM will be briefly discussed.

Random Access Memory. Let us start with the basic RAM (Random Access Memory) chip. It is called "random access," because the CPU can access the memory addresses within the chip in any order. Such memory does not have to be accessed in sequence starting at address zero (0). (This is also true of non-volatile ROM, but usage has assigned random access only RAM.)

Static RAM

The basic "static" RAM memory element is formed from a conventional flip-flop — a multi-transistor arrangement having two outputs each having a polarity opposite to the other. Thus, as shown in Figure 1A, if one output is logic-1 (high), the other output must be logic-0 (low).

A trigger or toggle signal causes the flip-flop to change states. Without the application of a trigger signal, the flip-flop will remain in its last state as long as the dc operating power is applied. In other words, as long as dc operating power is applied, the flip-flop "remembers" the one bit of data it has been asked to store.

Dynamic RAM

Unlike the multi-transistor static memory, a "dynamic" memory cell is formed from a single MOS transistor whose output is determined by the charge (or lack of charge) on a physically tiny, diffused, semiconductor capacitor associated with its gate element. This is shown in Figure 1B.

(Thus, whether static or dynamic RAM is used, eight memory cells are needed to store one 8-bit byte at one bit per stage.)

In dynamic memory, when data is applied, the tiny capacitor is charged, the associated MOS transistor is turned on, and remains on as long as the capacitor is charged.

Since the physical capacitor is very tiny, it implies a very small value of capacitance. Thus, the extremely small charge will dissipate in a very brief time — usually measured in milliseconds. Therefore, to

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Nevada Pilot and Nevada Edit The Rest of The Story

by Thomas Miller

Having recently purchased NEVADA PILOT and NEVADA EDIT software from Ellis Computing, I was interested in their capabilities. The PILOT programming language was required for my work on an interactive dialogue program to simulate a "Trivial Pursuit" type game. Pascal and BASIC appeared too awkward for the necessary string matching and prompting required. PILOT appears to solve the string matching requirements, as well as the overall programming requirements (even allowing program segmentation for very large file sizes). I was impressed with the basic concept behind the PILOT programming language, and can really appreciate its use in drill and test environments, such as found in school and university classes. Its basis as a Computer Aided Instruction (CAI) software is well classified.

PILOT stands for Programmed Inquiry, Learning Or Teaching, and as implemented by NEVADA software for my NorthStar Advantage computer, worked well, though no graphics options are incorporated. The Programmer's Reference Manual was adequate, although more examples should have been given in the description of each command. This was especially true for the Jump (J:) and Compute (C:) statements. The PILOT program works similar to a typical interpretive BASIC, i.e., it runs without a compilation phase, and has a built in editor to facilitate program creation and changes. Some commands may be executed both in the Run mode (when the program is being interpreted) as well as, in the Immediate mode (after a READY prompt). This is similar to several versions of BASIC which allow statements to be executed while in the BASIC interpreter or while part of a program (i.e. a statement numbered code line). I enjoyed the ease of editing while still in the PILOT command file, in Edit mode, and then, (after saving program edits to disc), executing a program segment for proper operation.

There were some anomalies noted while writing and debugging my PILOT applica-

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Timex Sinclair Survival Column

by Mark L. Fendrick

The T/S 2068 has some very powerful commands in its BASIC which have, for the most part, been overlooked in most programs I have seen recently. Perhaps this is due to the fact that most T/S 2068 users are also T/S 1000 or ZX-81 owners who originally learned BASIC on the earlier computer, and the new commands are not fully demonstrated in the T/S 2068 manual.

One of the most valuable of these commands is the DEF FN keyword which is accessed from the shifted extended mode on the 1 key. This function allows you to create your own command to perform complex calculations.

Here is a short routine which rounds a number to the nearest two:

```
10 INPUT "Enter a number ";a

20 LET round=(INT((a/2)+.5))*2

30 PRINT round

40 GO TO 10
```

If you had a program which needed to round off numbers often during its execution you would have to either rewrite this whole equation each time, or set it aside as a subroutine to be called via a GO SUB command. Each of these procedures can be awkward and use more memory than necessary. This is a situation which you may want to use DEF FN. Try this short variation of the above program:

```
10 DEF FN r()=(INT((a/2)+.5))*2

20 INPUT "Enter a number ";a

30 PRINT FN r()
```

Line 10 sets the defined function to the formula used to round off. Now anytime we use FN r (), it will round off variable a to the nearest two. But what if you have a few different variables you wish to round off to numbers other than two? In the above example, the function you have defined will only round off what is represented by the variable a, to the nearest two. We can define this same function in such a way that it can be used in a number of different situations. Try it this way now:

```
10 DEF FN r(x,y)=(INT((x/y)+.5))*y

20 INPUT "Enter a number ";a

25 INPUT "Round off to? ";b

30 PRINT FN r(a,b)

40 INPUT "Enter second number ";second

50 INPUT "Round off to? ";round

60 PRINT FN r(second,round)

70 PRINT FN r(97,4)
```

As you can see in this example, by using variables in the defined function, you can use it to perform the calculations on variables other than the ones used in the definition. The thing to remember here is to make sure that when you first define the function, you make sure to specify the elements of the defined function which will vary when used. The variables which will represent these elements must be placed within the parentheses. When using the function within your program, be sure you insert the proper arguments within the parentheses. In this program we are interested in constantly redefining both the number we wish to round off, and the number we are rounding off to. In line 10 we have placed the variables which represent these inside the parentheses as x (the number) and y (to which it is to be rounded off). The program, however, does not use the same variables (lines 20, 25, 40 & 50), so when we use the defined function in lines 30 and 60, we insert the proper variable names. As you can see in our last example, line 70, it is not necessary to use a variable; you may also use actual numbers if that is more convenient to the program. There is no limit to the number of arguments you may put into the parentheses.

This same user defined function can be used with strings as well in the following fashion:

```
10 DEF FN a$(t$)= t$(8 TO )

20 READ w$

30 READ x$

40 READ y$

50 READ z$

60 PRINT FN a$(w$)'FN a$(x$)'FN a$(y$)'FN a$(z$)

70 DATA "garbageone","garbagetwo","garbagethree",
"garbage4"
```

Here we have defined function a$ to take a slice of whatever string we use as the argument. In this case it will take the string and cut off the first seven characters.

As you can see, in this manner you may collect a library of formulae and routines which can be inserted into various programs you may write. The formula for rounding off is one which I have used in a number of my own programs. Here is a chance for you to show your expertise and share some of it with your fellow Sinclair computerists. Send me one or two of your favorites in care of **Computer Shopper (P. O. Box F, Titusville, FL, 32781)** and I will print them in this column.

A second set of instructions which were not found in the earlier versions of Sinclair BASIC are the error trapping commands; ON ERR GO TO, ON ERR CONTINUE, and ON ERR RESET. Using these instructions you can avoid some of the memory robbing routines which were necessary on the T/S 1000/1500.

ON ERR (shifted extended mode on the F key) followed by GO TO and a line number causes the program to jump to the specified line rather than stopping the program execution with an error report code. Once an ON ERR GO TO command is encountered, the program will always jump to that line until another ON ERR command is encountered. Try this program which will cause the character set to be printed:

```
10 FOR f=32 TO 500

20 PRINT CHR$ f;

30 NEXT f
```

Notice that when the value of f reaches 256, the program stops with an error code B Integer out of range. Now add this line and RUN the program:

```
5 ON ERR GO TO 10
```

This will cause the program not to stop, but to revert to line 10 where the loop is reinitialized and the value of f is reset to 32. You will find, however, that once the ON ERR command in line 5 is encountered for the first time, you have no way of stopping the program except by pulling the plug. Since BREAK causes the program to stop with an error report code, it too is disabled by the ON ERR GO TO command. To avoid this you must insert some form of escape procedure. One way of doing this is to add the following lines:

```
15 IF INKEY$<>"" THEN GO TO 100

100 ON ERR RESET
```

By pressing any key you can force the program to jump to line 100 where it encounters the ON ERR RESET (shifted exended mode on the P key) which reinstates the error code reporting. Now BREAK and STOP will do just that - stop the program execution.

You can also use this command to control the flow of a screen listing. The following routein was originally written for the T/S 1000/1500 as a method of preventing the program from stopping when the screen fills up upon printing a list which is greater than the 21 lines allowed.

This routine allows nineteen lines to be PRINTed on the screen before the CONTINUE prompt is displayed. Line 20 is the line which checks to see if nineteen lines have been PRINTed. This line operates on the premise that the value of F divided by nineteen will only be an integer value after the desired nineteen lines have been PRINTed. When that condition occurs control is transferred to the subroutine at line 100, which PRINTs the prompt, and then requests that you make a choice. Line 120 assures that only the proper responses are recognized. Any input other than a C or N will cause the program to jump back and wait for a correct reply. If you respond with a C indicating that you wish to continue, line 130 will clear the screen, and return you to the listing procedure, and will list another nineteen lines before repeating this process. If you reply with an N, you will go back to the main routine where line 25 will send you to line 500 which may be the program's menu or any other selected routine. The reason this occurs from the main routine and not from the subroutine is so that the GOSUB stack which stores the location to RETURN to is cleared. If this is not done, each time this routine is used, memory will be used unnecessarily.

Using the ON ERR commands, however, this procedure can be reduced to this:

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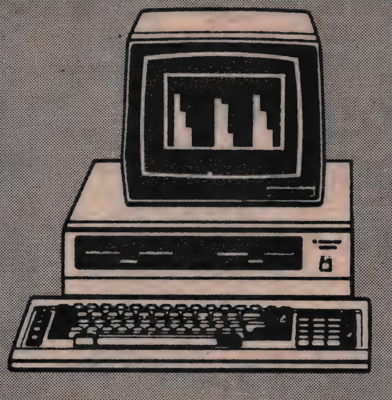

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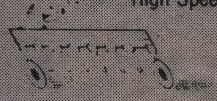

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SANYO

Languages and Versions of MS-DOS

by Fred Blechman

This is the first of my Sanyo columns for **Computer Shopper.** These columns will be devoted to the Sanyo MBC 550/555 series, and not earlier Sanyo micros. The information, like my Sanyo book, will be aimed at the relative beginner or intermediate user (but not the complete novice), and will provide information gleaned from using my Sanyo since I bought it in early January, 1984.

Equipment Freak

Since I was weaned in early 1978 on a Radio Shack TRS-80 Model I Level I 4K microcomputer, I have worked with many other micros. I've written books about using the TRS-80 Model I/III, Timex-Sinclair 2068 Color Computer, Coleco ADAM, and Apple IIc in addition to the Sanyo book, and have had over 100 microcomputer-related articles published.

I still own my Model I TRS-80 (now upgraded to 16K, Level II, with a Stringy Floppy wafer drive), and have added two TRS-80 Model III 48K dual-disk systems, a Radio Shack MC-10 Microcolor Computer, two Sinclair ZX-81s, a Timex-Sinclair 1500 and 2068, and an ADAM, as well as the Sanyo.

Add to this ten printers ranging from thermal to daisywheel to plotter, and at least a half-dozen monitors, including RGB, and you can tell I'm somewhat obsessed. I've also had a Sinclair Spectrum, Sinclair QL, and Apple IIc.

I L-O-V-E My Sanyo

"So", you might ask, "with all these toys, what's your favorite system?" My overall-favorite machine is my Sanyo! With it I use my favorite printer, the CP80 Type 1, a Mannesmann-Tally Spirit-80 workalike (dot-matrix with square pins and mylar film ribbon cartridge) that uses Epson commands. This full-featured printer is not very well known or well distributed, but is available from Everett Charles Marketing Services, Inc. The printout, at 80 characters per second, is, in my opinion, markedly superior to any other dot-matrix I've used in the draft mode. While it does not claim "near letter quality", the printing is sharp and dark, probably due to the square pins and film ribbon.

Between the parallel output of the computer and the printer I use the "PC Spooler", a newly-available 16K printer buffer that sells for $99 (including cables!) from Stewart Instruments. The 64K version is $139. This accepts and stores the output going to the printer so the computer is free to do other things while the much-slower printer does its thing.

I use both an amber Comrex CR-5400 9" monochrome monitor, and a Taxan 420 RGB color monitor at the same time. The Comrex gives me a sharper picture for text, and the Taxan provides striking color.

We All Begin Somewhere

I started with the Sanyo MBC 550 (one single-sided drive, MS-DOS 1.25) and later replaced Drive A with a double-sided drive and MS-DOS 2.11. By the time you read this I'll have changed Drive B to double-sided.

You may wonder why I didn't start with the two double-sided drives. For one thing, when I got my Sanyo, the only choice was one or two single-sided drives (the MBC 550 and the MBC 555 respectively.) Since then the choice has broadened to include the 550-2 (one double-sided drive) and the 555-2 (two double-sided drives.)

The other reason for me not getting a two-drive Sanyo to begin with was that I wanted to address my articles and book to a minimum system. I like to do the most with the least and to resist, as my friend Bill Barden, Jr. calls it, "the rapture of technology." My entire Sanyo book, and all the programs I've written for the Sanyo, are compatible with one single-sided drive.

The KISS Principle
("Keep It Simple, Stupid!")

If you like to make things complicated, you won't like what I write. I'm constantly amazed at the sophisticated equipment some personal computer owners use to balance their checkbooks - something the bank has already done for them! The degree of overkill in computer equipment for the job being done is a tribute to micro marketing.

Anyhow, off my soap-box and on to some information that should interest you if you are a Sanyo MBC 550/555 owner, or if you are considering buying one of these beauties.

IBM PC Compatibility

Although the Sanyo MBC 550/555 is a 16-bit computer using the same microprocessor (8088) as the IBM PC, it does not run most IBM PC software without software revision. This is primarily due to differences in the internal structure of the MS-DOS (primarily, the BIOS section) supplied by Sanyo, and also to several differencs between Sanyo BASIC and

IBM PC BASIC or BASICA

A "Video RAM Board", which makes the 550/555 more compatible with IBM PC software, is now available from Sanyo dealers for $199 or less. It includes GWBASIC, a generic form of IBM PC BASICA, thus allowing IBM PC BASIC programs to be LOADed and RUN on a Sanyo. However, problems still exist in RUNning some programs, and the only way to tell for sure is to try.

Most of the differences between the IBM BASIC and Sanyo BASIC are covered in a chapter of my book, and are too detailed to go into here. Fortunately, a large number of software suppliers are supporting the Sanyo MBC 55X by modifying their software, where necessary. There are literally many dozens of programs now available for the 55X, and you can expect hundreds more as User Groups, newsletters and magazines spread the word, bringing programs and 55X owners together.

A Potpourri

The purpose of this series of columns is to inform you about a small portion of the different types of programs available for the Sanyo MBC 550/555. This month we'll cover "paperware" (magazines and newsletters), and versions of MS-DOS for the Sanyo. In future columns we'll cover programs for disk-to-disk transfer between different computers, telecommunications, utilities, business, word processing, graphics, screen dumps, games and simulations.

Where noted with an "(FB)", I've actually RUN the programs myself. In some cases, noted with "(FC)", I've used the valuable services of my close friend and Sanyo enthusiast, Fred Clabuesch, and have culled information from his detailed reviews. In all the other cases, I've drawn information from news releases or vendor advertisements.

Paperware

Books, magazines, and newsletters are a valuable source of information to update and expand on the manuals supplied with the 55X. They contain new applications, programs, operating hints, and solutions to hardware and software "bugs". Also, the advertisements in magazines and the references in newsletters can lead you to the sources of products and information you are looking for.

User Groups and Newsletters

Sanyo produced several other computers prior to the 550 series, which led to the formation of various small User Groups around the country. Several new User Groups have been formed - and more certainly will! - specifically oriented toward the reportedly 80,000 (and growing) group of Sanyo MBC 550/555 owners.

A few of these User Groups put out newsletters, available by annual subscription. Frequently newsletters supply new and exclusive information "discovered" by a user and shared with the group. A list of User Groups is published periodically by Computer Shopper and Soft Sector magazines.

Software

There are many different categories of software for the 55X, from different languages and operating system versions to a DC-10 flight simulation. It would be hopeless to cover all those I've seen reference to, let alone the ones I don't even know about!

Instead I've selected some representative programs from each group and will give a brief description of those. I've tried not to "rate" these programs, but have indicated those I consider most valuable. That judgment is mine, and may not apply to your application. Indeed, there may be far better programs out there now, or forthcoming.

Languages
Sanyo BASIC

Sanyo BASIC is supplied with the 55X computers. This BASIC is very similar to the BASIC used by the IBM PC, but does not have all of the graphic commands of IBM's BASICA. There are just enough differences between Sanyo BASIC and the others that many programs written in IBM BASIC or BASICA will not run using Sanyo BASIC. Worse than that, Sanyo BASIC does not even recognize, and will not LOAD, a program SAVEd in the normal manner with BASIC or BASICA. If the program is SAVEd on an IBM PC (or compatible) in ASCII format, it can be LOADed into Sanyo BASIC, but it still will probably crash when it comes to a syntactical difference in the program.

A partial solution to this is to use the new Sanyo GWBASIC, which comes with the Video RAM Board mentioned earlier. It is supposed to be available by now separately from Sanyo dealers for $42. Unfortunately, when used with Sanyo's MS-DOS 2.11, GWBASIC (which, to add to the confusion, is called BASICA by Sanyo!) does not recognize the BREAK key during a program RUN or LISTing. The only way to exit the program is to reset the computer, thus losing everything!

A different DOS, DS-DOS PLUS, described later in this article, does recognize the BREAK in GWBASIC when used with the CTRL key.

The dilemma here is that if you use GWBASIC, for the convenience of compatibility with the IBM PC, you lose compatibility with Sanyo BASIC. If you need to translate an IBM PC BASIC or BASICA program, you can use

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Does Mac Mean Business?

Continued from page 39

provide the visual capability to properly present this information for sales and management purposes." Hudak further looks to the availability of "JAZZ" as a bridge between these tools that will let the Macs function within the overall framework of the IBM environment.

Rob Martin at Home Box Office (a division of Time, Inc.) in New York uses the only Mac in the organization (there are over 80 IBM-PCs). He feels strongly that Macs have a place in large business environments "doing the things they do best." His Mac is primarily used for graphics presentations, word processing and as a "thinking aid" (idea and outline processing). Martin stresses the differences between what he calls "personal" vs. "departmental" use of microcomputers. He considers such applications as the exchange of spreadsheet data, budget management and maintenance of multi-user data bases to be activities of a departmental nature and does not see the Mac challenging the IBM domination in that arena. He rather sees IBM continuing to define the environment and the Mac fitting into such environment (through network interfaces, conversion programs (ex. dilithium Press' "PC to MAC and BACK") and communications) to capitalize on its strengths. Although he feels that the availability of Lotus "JAZZ" will be of tremendous benefit to the Mac, he still envisions the continuing dominance of the IBM and compatibles in the departmental activities. To further substantiate this forecast, he points to the providers of programs for main frames who, in developing micro versions of their software, have chosen to market versions solely for the IBM/MS-DOS standard (ex. PC/Focus from Information Builders, McCormmick Dodge's General Ledger products, WYLBUR/PC from OBS software). Such decisions, Martin feels, will make it more and more necessary for Apple to place the Mac within the IBM/MS-DOS environment.

While agreeing with Martin's enthusiasm for the Mac for graphics related activities, a data processing executive of one of our largest insurance companies (who asked to remain nameless due to his firm's corporate policies) disagrees with the need for interaction between the Mac and the IBM environment. He feels that they are "different machines with quite different strengths" and should be treated as such. In his organization, where approximately 5 percent of the microcomputers are Macs, the Mac is used for the publishing of internal newsletters, the maintenance of firm and departmental schedules (with "MacProject") and for developing graphic displays. The same executive further makes the comment "Mac will make all computer companies address the issues of simplifying user interface and intermingling quality graphics and quality text in displays and reports."

Jack Halbert of Merrill Lynch, whose organization is charged with the support of microcomputers within Merrill's vast retail organization, feels that software and hardware companies have already begun to deal with these issues and the result will be a diminishing of the uniqueness of the Mac. He points to Digital Research's "GEM" as an example of the importing of "Lisa-like" technology to the IBM environment and feels that this trend is just beginning. He also stresses the need for compatibility within an organization and explains that the incompatibility of the Mac with Merrill's chosen standard of MS-DOS has been the major reason why his organization has chosen not to sanction the Mac as a supported machine (although a few Macs have found their way into Merrill branch offices). Jack, who personally likes the Mac as a machine for new users and "The Rest Of Us," feels that Apple will (and should) continue to do well with the Mac in the educational and home markets but will prove to be non-competitive with IBM in the Fortune 1000 marketplace.

In addition to the reservations enumerated above, we found a number of other stumbling blocks to the Mac's widespread success in the corporate world. One such difficulty is the lack of a large software universe in the Mac world. While there is widespread agreement that such programs as "JAZZ", Microsoft's "Word" and TK!Solver from Software Arts are not only fine systems but actually perform better and/or easier than their PC counterparts, there is still not the wide choice of product available for the Mac (ex. there are several hundred data base products available for the IBM-PC but relatively few for the Mac; there are hundreds of accounting systems of every possible complexity and type in the MS-DOS world but a minimal number of Mac packages). This condition may really not be of great importance, pro-

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MacUniverse

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by Garland Press. At $16.95 (paper) this book is an excellent introduction to on-line databases. This 600 page book describes more than 100 of the most important business oriented databases. It (1) examines the features of each database; (2) points out differences among competing databases; and (3) includes some sample searches. It also contains a "Special Offer Section." This section includes numerous discount and free offers. For example, you can get • two free hours of time on Compuserve or save $50 on a Bytcom modem.

The second book is Prentice-Hall's "Financial Calculations for Multiplan." This book provides a number of business and financial templates to use with Multiplan. If you have ever spent hours trying to create a template, you will find this book very helpful. This book is not an introduction or tutorial to Multiplan. It assumes the reader already has a basic understanding of how the program works. My only caveat with this book is to be sure you can use many of the templates. If you only need one or two, borrow the book from your local library.

For those of you trying to create a "picture perfect" diskette label, here is a way I discovered. Use MacPaint to create your label and print it out on any piece of paper. Make a photocopy of the paper. Leave the original in the copier. Take the copy and tape the label (a piece of tape on the front edge will do) over the copy. Feed the copy sheet through the copier again. When the sheet comes out, the label will have the photocopied image on it. And unlike using the Imagewriter, there will be no ink on the label to smear.

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Does Mac Mean Business?

Continued from page 64

vided those systems available for the Mac were the best possible in the area, but it gives the impression that the IBM or compatible is a safer choice.

Another major problem in marketing the Mac in the large corporate world is the "mindset" of the average data processing manager who has a long standing relationship with IBM because of the firm's main frame systems. Such a person is usually quite reluctant to go away from "Big Blue" and is often unwilling to even consider the values of the Mac. This mindset often extends right to top management that is convinced of the infallability of the firm from Armonk. **Margaret Levine, formerly Manager of Office Services for a Fortune 500 subsidiary,** recalls abandoning her analysis of the Mac as a corporate tool when it became clear very early in the study that anything resembling a computer without IBM's name on the side would be unacceptable to a management that had previously taken over a year to convince that PCs (even IBM's) were more than toys (Levine feels that the advent of JAZZ will diminish this problem as some management personnel now regard the "Lotus" with the same reverence formerly reserved only for IBM).

Add up all of these factors and it is obvious that Apple has a tough road to make significant corporate penetration with the Mac. The announced Apple LaserWriter and the AppleTalk network are substantive moves by Apple to mount more of an attack in this marketplace. Although these entries are certainly welcome, it seems from the above comments and a review of marketing successes to date that the Macintosh is slated to be a very useful tool for many applications within Fortune 1000 corporations but will never challenge the IBM-PC for control of the microcomputer environment; it will rather be treated as a special purpose peripheral when one thinks of an entire business network. ●

MacUniverse

Continued from page 66

The only limitation with this process is that (1) it only works with dry copiers, and (2) you must be able to individually feed sheets.

If you are considering getting an Apple 1200 modem, read on before you spend your money. The Apple 1200 is just a repackaged U.S. Robotics Password modem. The only difference is that the Apple comes with a modem cable. You can easily save $100-$150 by buying a plain Password from one of the many advertisers here and getting your own cable (about $35.)

This month's major Compuserve selection is another communication program. If you liked MacTep, you will love RLMTEP. It is like comparing a Volkswagon to a Cadillac. RLMTEP is a series of three programs, RLMTEP.111; RLMTEP.202; and RLMTEP.203. They are found in data library number 8. RLMTEP.111 is the instruction file and assumes you know how to use MacTep. RLMTEP has the following advantages: (1) it supports 10 macro instruction sets. A macro set allows automatic execution of commands. For example, with the appropriate modem, it will allow you to have complete auto log ons to Compuserve, the Source, and the like; (2) it allows you to exit either to the SYSTEM or BASIC; (3) hang up the modem; (4) clickable scroll control (one click will stop scrolling and another will start it; and (5) the ability to change the fonts on the screen.

Another nice Compuserve program is MASINI.HCX. This is an application that will initialize any diskette you insert into the Mac without having to deal with the initialization dialogs. There are a number of safeties built in so you do not initialize an already initialized disk. Look for it in Data Library number 4.

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Mac Hints

Continued from page 40

Using Non-Apple Printers

If you already have a printer, or if you want a more powerful printer than the Imagewriter, then you may wish to use it with your Mac. Various manufacturers (Epson, Toshiba, and Okidata among others) have drive files which replace the standard "IMAGEWRITER" icon in the system folder. Any control codes and character sequences which normally would have been sent to the Imagewriter are converted into the proper codes for printout. Normal programs which use the Finder's print driver will not have any problems. But programs which go directly to the Mac's serial port (e.g. Microsoft BASIC) must be rewritten to use the proper control sequences needed. Naturally, to be hardware compatible with the Mac, the printer must be set up in serial mode, user DTR handshaking, and a proper cable must be wired.

If your printer only has a parallel interface, then it cannot be attached directly to your Mac. The serial output from the Mac must be converted into the parallel signals which your Mac uses. There are dozens of different Serial to Parallel converters available, and you can probably buy one for under $100. Make sure when selecting one that you can get it with a Mac cable on the serial end, or you will have to purchase an extra cable.

Another solution to the foreign printer problem is to

Continued on page 68

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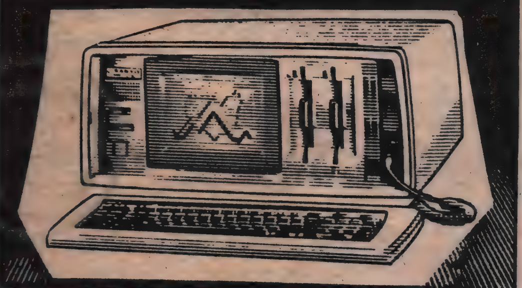

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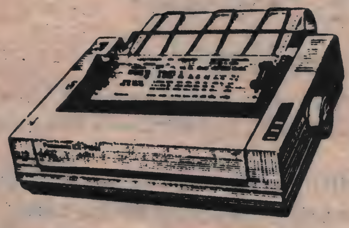

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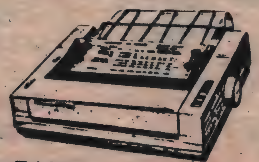

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Mac Hints

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emulate an Imagewriter. As long as the printer accepts and uses ALL of the Imagewriter's control sequences, the Mac will think that it is attached to an Imagewriter. Apple's Scribe uses the Imagewriter codes and can be easily attached (anybody interested in writing a color print program for the Scribe on the Mac?). Other manufacturers have emulator boards which plug in and either translate the Imagewriter codes into native code, or control the printer directly, in the same format as the Imagewriter.

In addition to modifying the printer to look like an Imagewriter, or modifying the Mac to look at the printer properly, there are a variety of programs which will directly talk to various printers. Pro-Print is a software utility designed to print MacWrite files to a variety of letter quality printers. Microsoft Word supports a variety of different printers, and various other programs have the capabilities to support printers other than the Imagewriter.

With any printer on the Mac (or any other computer), the most common complaint is printout speed. Where a screen full of information can be displayed or updated in less than a second, it takes a minute to print that screen to the printer. Unfortunately, inexpensive (under $20,000) printer electronics limit print speeds to two lines per second (max). Computers calculate over a million times faster than printers, and leave the operators twiddling thumbs, or on coffee breaks while printers are at work. Fortunately, there is a (sometimes) solution. A device called a print buffer (or hardware spooler) will help speed up throughput. It is actually a single purpose microcomputer, and the ultimate GIGO (Garbage In, Garbage Out) device. It takes in characters as fast as the computer can send (as much as 960 characters per second in the case of the Mac), stores them, and sends them to the printer as fast as the printer can accept it. Unfortunately, you don't get a free lunch. Since the Mac has to send much more information than a normal (text only) computer, the buffer has to be very large (128K +) to do any good, and there are circumstances where the buffer really won't help. If you are downloading information off a modem, then the modem will limit the speed of your printout. If you are using single sheets of paper, then the speed you can feed in new sheets into the printer will be the limiting factor. And, if you fill up the buffer, then you will go back to waiting (then you will be waiting for the buffer to clear, instead of the printer!) But if you need high volumes of printout, and you are tired of waiting for the printer, then a buffer may be the answer for you.

Getting a non-Apple printer may scare you, and it should. There are many compatibility problems when using a second part printer or interface. Whether or not they will affect you is something which only you can decide, after careful thinking. Your decision about a modem is much simpler. The Apple Modem is actually made by US Robotics, and conforms to the "Hayes Standard". When DC Hayes came out with the Smartmodem in 1979, they developed a set of command strings which the host computer would send to instruct the modem. The command "ATD" would pick up the phone and dial, "ATT" would select touch tone mode, "ATH" would hang up the modem, etc. Most other modem manufacturers decided to use the same "AT" commands, and a de facto standard was established. Any Hayes compatible modem can be used with the same programs used with an Apple Modem. If a modem is not Hayes compatible, it can still be used, as long as the terminal program can be properly configured. Since the Apple Modem uses the DB-9

Continued on page 69

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Mac Hints

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connector used by the Mac, and most other modems use the standard DB-25 connector, a special cable must be wired. You can either purchase a prewired cable, or wire your own. Diagram No. 1 shows the proper pinouts for most modems.

Power Problems

Unfortunately, your Macintosh has external connections and has to interface with the rest of the world. It is plugged into an AC wall outlet, and it may also be plugged into a phone line. Naturally, power and phone circuits can cause problems with computers. Brownouts are a nuisance to most people and can cause serious problems for computer users. A lightning strike on a telephone pole can destroy a modem. I HIGHLY recommend using surge protectors on both phone lines and power lines. A phone-line surge protector will cost less than $10, and power-line protectors will cost between $7.95 and $79.95 (depending on features). They are well worth the cost. If your power company is unreliable, then you may wish to get an uninterruptable power supply also. This is a battery operated device which will automatically power the computer whenever power fails. It will run you between $200 and $400, depending on the wattage you need.

Booting Mac

Many programs for your Mac require a "Cold boot" (starting your computer by powering it on). If you wish to load a particular STARTUP diskette, or if you use various turn-key applications, you must restart your system. You can either turn off the Mac, and turn it back on, or press the RESET switch on the side of your Mac. (If you Mac doesn't have a RESET switch, you probably forgot to put it on. Look in your accessory box, the T-shaped piece of plastic is your RESET switch). Turning your Mac off and on is one of the WORST things you can do to your Mac. Each time you cycle the power on your Mac you give a microscopic power surge to the ICs and CRT in your machine. By themselves the surges won't do anything, but put together, over long periods of time will eventually degrade your machine. Hitting the RESET switch will do a Cold Start safely.

Mac Noise

If you try to use your Mac when somebody else is sleeping in the same room, you probably won't have a roommate for too long. The Mac's speaker is noisy! Prompts, alarm signals, and music all make noises out of the Mac's speaker. Fortunately, there is a simple solution. On the back of the Mac, there is a mini jacket with a musical note icon. If you put an audio cable into this jack, and attach it to a stereo, then you can record, or amplify, the Mac's sound effects. If you plug a mini plug into the jack, it will silence the Mac's internal speaker. If you have an extra earphone cable from a cheap radio, just cut off the plug, and use it. Note: although this will silence the Mac's speaker, it will not silence the disk drive, or any noises you may make. If you have a tendency to shout while playing a game (or programming) you may still get a very annoyed roommate.

Mac RAMDisk

Upgrading your Mac to a 512K Fat Mac makes your machine much more powerful, but you may find that many of your programs will show little or no difference in execution. Programs which don't need more than the standard 128K of memory to run, and don't have user space won't show any improvements. As much as ¾ of your memory will be sitting idle. Many of those programs are disk-based, or require frequent diskette swaps. For those programs a RAM disk is almost essential. A RAM disk program fools the Mac into thinking that part of the memory doesn't exist anymore. That memory is set aside, and used as a pseudo disk drive. If you have a standard one drive system, your Mac will think it has a second drive installed. If you have a two drive system, the Mac will think that there is a third drive. Since the "drive" does not have the motor or I/O logic which a normal drive has, it is much faster. If you need to make several copies of a particular program, you just load the diskette into the RAM-drive, and keep copying that "Drive" onto floppies. Naturally there are a couple of disadvantages. Since the information is stored in RAM, the information on the "Drive" will be lost if the power is shut off or lost. Whenever you use a RAM drive, that memory won't be usable by your program. But in many cases, a RAM drive program will help you speed up disk operations.

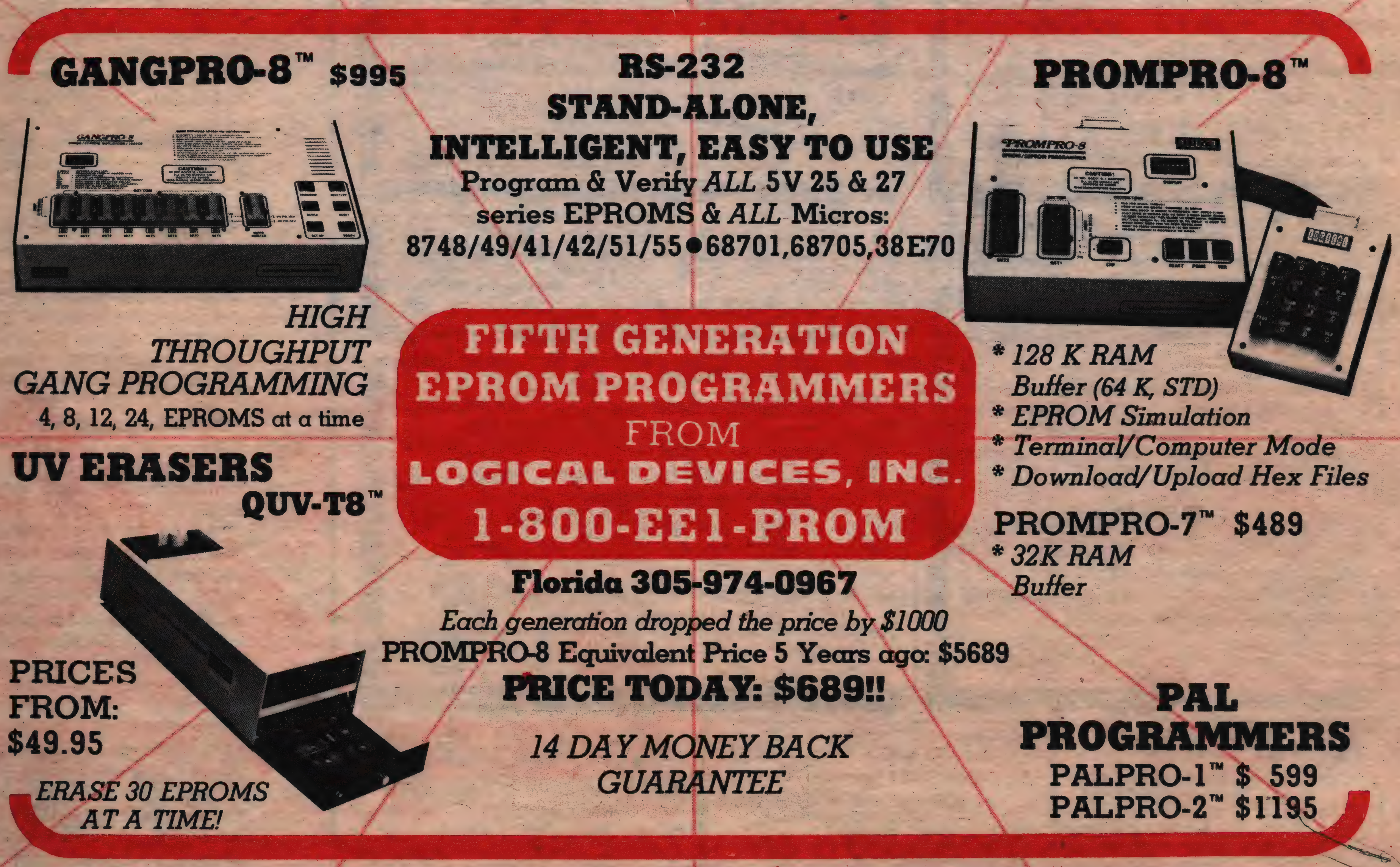
Write Protect

The Mac hardshell disks have one major advantage over standard floppy diskettes. Normal diskettes require small pieces of tape over the notch to write protect. The Mac's 3-½" hardshell disks have a built in slide mechanism (Diagram 2). Anytime you copy disks, your original should be "write protected" (hole open). If you don't protect your originals, you can easily erase them. A properly functioning disk drive will not write onto a protected diskette. (Naturally the diskette can still be erased by high magnetic fields or physically damaging it). Whenever you use a program which doesn't write to the disk, you should write protect it.

Cleaning Disk Drives?

Many times the question comes up - "Should I clean my disk drive?" I know that I'm going to get alot of comments about this, both pro and con, but my personal opinion is that cleaning your disk drive does more harm than good. Besides potentially harming your drive, and voiding your warranty, all cleaning kits include some abrasive (even kits advertised as "non-abrasive," which will eventually degrade the magnetic read/write head. Sony 3-½" drives have been in use for several years now,

Continued on page 72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Desk Accessories
Continued from page 40

file IDLE.DOC. This desk accessory is free.

If your Mac only has 128K get COMPAC.HCX. This accessory simply clears as much memory as possible. I primarily use it when ejecting disks while still keeping them on the desktop file.

DELETE.HCX allows you to delete files from within any application that supports desk accessories. I find it useful when working with MacWrite. Many times I get a message saying there is not enough space on a disk to save a file. By calling it and deleting a file or two, I then have enough space to save the new file.

CALEND.HQX puts a calendar into the desk accessory. When used it generates the current month's calendar with the current date highlighted. You can type approximately 7 lines of notes for each page. For example, you can move the calendar ahead one week and type a reminder to yourself. When you call the calendar on that date, your note will reappear. The calendar can also scroll forward and backwards both in months and years. The only problem with this desk accessory is that it is very big and will not work with some memory intensive programs (it does work with MacPaint and MacWrite).

If you want to be able to examine disk file information then you need DSKIDA.HCX. It allows you to see all mounted disks and how much free space they have; set the default drive, which lets other desk accessories access all disks; see how much memory is available; see the names and other information for all files on a disk; and delete any file. The only problem with it is that it is incompatible with certain application programs (e.g.ThinkTank). It is being distributed under shareware. Make as many copies as you like and give them to all your friends. But if you keep it and use it you should send the $10 to the author.

CE Software has created three desk accessories to go with its Desk Accessory Mover. The first MCKPNT.HCX (called MockPrinter) prints text files. Many people are using it as a print spooler. The second accessory is MCKTRM.HCX (MockTerminal). This is a terminal desk accessory. It supports 300 or 1200 baud, full or half duplex, will auto dial numbers, and let material be downloaded. The third desk accessory is MCKWRT.HCX (MockWrite). This is a text-editor. I find it very useful when working with Multiplan or MacPaint. If you like them you should send $25 to CE Software.

The cutest (and most useless) desk accessory is DSKBUG.HEX. Call it and a bug starts crawling up your screen. It is cute and will entertain the children, but how I wish there was a way to turn it off.

If you do not like Apple's built in calculator, there is one based on the Texas Instruments Analyst 2. The file ANLYST.HEX is only a four function calculator. The full version is available from Networks Consulting Corp. Networks also has a Ram Disk accessory available for $29.95. Called the Ram Disk II it allows you to create a ram disk on the Fat Mac. If you are satisfied with only a four function calculator but want reverse Polish notation (used on Hewlett Packard calculators) then download DAMRPN.HEX.

Extras' is a desk accessory that combines several functions into one. It has a window for showing the free space on a disk and for alternating between multiple scrapbooks. Another window shows the free memory remaining. Another function lets you delete files from within any application, and finally, there is a compact memory function. This accessory is distributed on the shareware system. If you like it, send $5.00 to the creator.

Desk Accessories mentioned in this article.

IDLE.DOC	(70003,701)
IDLE.HCX	(70003,701)
EJRSDA.HCX	(70006,513)
COMPAC.HCX	(72436,3374)
DELETE.HCX	(72436,3374)
CALEND.HQX	(74216,1312)
DSKIDA.HCX	(76074,762)
DSKINF.DOC	(76074,762)
MCKTRM.HCX	(70006,531)
MCKPNT.HCX	(70006,531)
MCKWRT.HCX	(70006,531)
DSKBUG.HEX	(70176,1375)
DAMRPN.HEX	(75015,1421)
ANLYST.HEX	(72065,267)
EXTRAS.HCX	(72436,3374)

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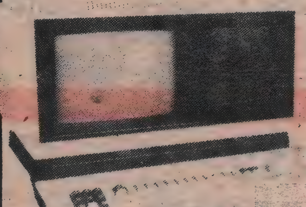

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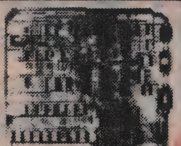

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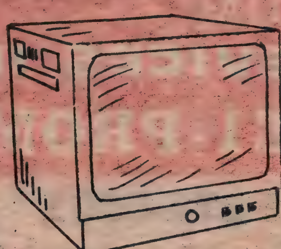

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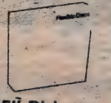

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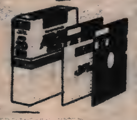

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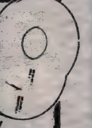

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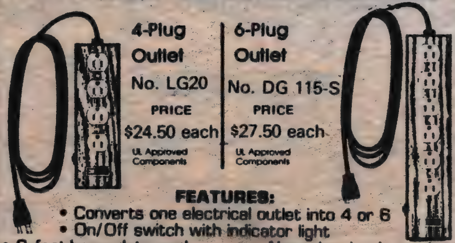

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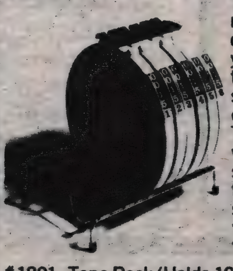

These racks allow easy, immediate access to tape, disks, and cartridges at your computer site without taking up a great deal of space. Designed for greater efficiency, yet economical. These racks are lightweight, with strong construction made of heavy duty wire with a durable silver-gray finish. Non-skid vinyl feet protect your desk top or work surface.

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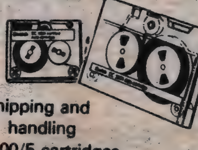

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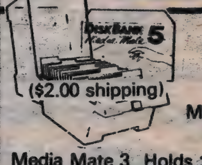

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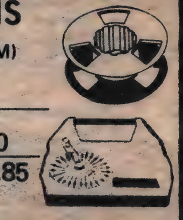

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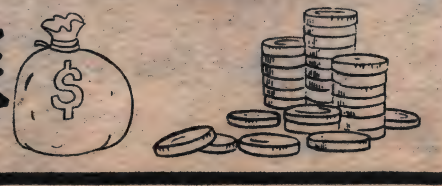

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Mac Hints

Continued from page 69

without cleaning, and without problems. Remember: Rule number two of repair: If it works, don't try to fix it! (Rule number one is: If you want a repair person to fix something, you have to make it fall in front of him/her.)

Mouse vs. Trac Ball and Other Gadgets

The Mac mouse has been described as the perfect menu selector. What could be easier than pointing at an icon, or a menu description? Apparently many people don't think so. Various second party input devices are also available for the Macintosh. There is a trac ball (basically an upside-down mouse -- originally designed for use by NASA for early spacecraft, but made popular in the video arcade). A trac ball has the advantage of less hand movement, and faster cursor movement, but it sacrifices precise screen positioning. If a trac ball is not your style, then consider a graphics tablet. The tablet's advantage is much more precise drawing ability,(providing you already know how to use a pen and paper to draw.) Its disadvantages are using your modem port, and non-compatibility with all programs. It is also more cumbersome to use, and it is much harder to "double-click".

If you want to keep both hands free to operate your keyboard, then the "Footmouse" may be the thing for you. As you might guess by the name, it is a pedal pad operated by your feet, much like you'd control the rudder of a plane with pedals. It does keep your hands free, but you will need to learn how to control the "feel" with your feet.

If you decide that you want a better cursor/input device for your Mac, then test out the various different trac balls, graphics tablets, and the Footmouse until you find one that you are comfortable with. Until somebody comes out with a brainwave controlled cursor/input device, there will always be room for improvement, and somebody will always be ready to come out with (dare I say it?) a better Apple Mouse trap. ●

DB9-M		DB-25M
1	CGND	1
5	TXD	2
9	RCD	3
3	GND	7
7	RTS	+ 20
		+ 8
		+ 6

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Diagram 1-

MAC MODEM

Diagram 2 -

[write protect diagram]

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Hayden Speller

Continued from page 40

You have five options: (a) accept the word as is, (b) accept and save the word to a user dictionary, (c) postpone action, (d) replace with; and (e) look the word up in Hayden: Speller's dictionary.

Accepting the word as it tells Hayden: Speller the word is spelled correctly. This is the default action and no mouse action is required.

Accepting the word and saving it tells Hayden: Speller the word is spelled correctly and that you want to add it to a user created dictionary at the end of the session. You must use the mouse to move the arrow into the "Accept & Save" circle and click it.

Postpone action instructs Hayden: Speller that you will return to the word later. You must use the mouse to move the arrow into the "Postpone Action" circle and click it.

Replace with tells Hayden: Speller that you want to correct the word. Whatever you type in the space will replace the suspect word. No mouse action is required.

Lookup is used if you are not sure how the word is spelled. Use the mouse to move the arrow into the "Lookup" box and click. Hayden: Speller will then search its dictionary for word matches. It will compare the first four letters and last three letters of the suspect word to see if there are any similar matches. If there are Hayden: Speller will display them. If one is correct, use the mouse to move the arrow over it and click. The word will automatically appear in the

Continued on page 74

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PANASONIC PRINTERS

The Panasonic KXP 1091 Printer
Near letter quality at the flick of a switch!

The 1091 zips along at 120 cps and has a 1k buffer It also has all the print modes of the Gemini 10X and Epson RX-80, plus a BIG difference The 1091 has a near quality switch Flip it and you get a super light 12 by 18 matrix with characters that rival a daisy wheel! The 1091 has both friction and tractor feed

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1092	**Please Call**
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(1090 does not have near letter quality)

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SG-15	Call
SD-10	$359 00
SD-15, SR-10, SR-15	Please Call

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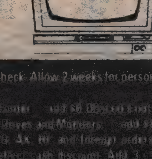
Amdek Color 1 Plus	$219 00
Color 600	$409 00
Other Amdek Monitors	Please Call
Sakata SC-100	$239 00
Sakata SG 1000	$ 95 00
Sakata SA 1000	$104 00



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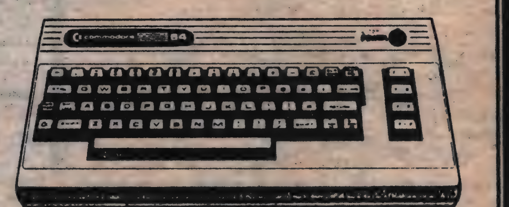

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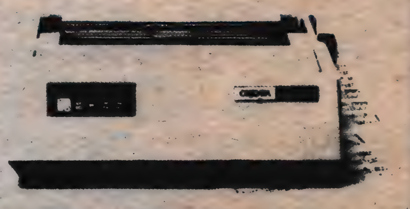

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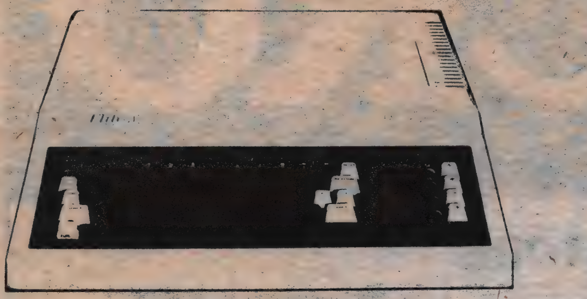

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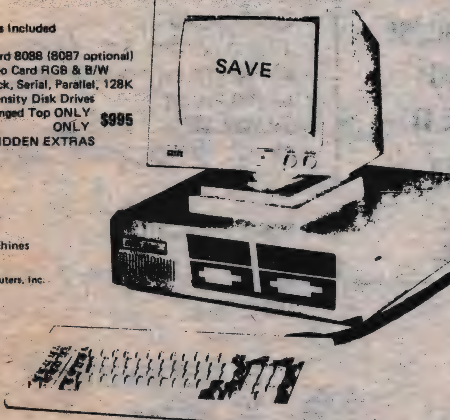

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Hayden Speller

Continued from page 72

"Replace With" box.

In the event you are not sure whether the word is misspelled or how to fix it (e.g. it is too or two), Hayden: Speller's "Scan Document" ([command] S) will display a dialog box for each suspect word. In each box will be a few lines of the document that precedes the word, with a hand icon pointing to the word that needs to be checked.

Finally, Hayden: Speller allows you to review all your corrections to make sure you are satisfied with them. If you are not, you can still change them.

Hayden: Speller also allows you to create specialized dictionaries consisting of those words selected by the "Accept and Save" command. The words can be saved to one of two files; §/MYWORDS or §/FILENAME (where "FILENAME" equals the name of the file currently being checked). If the words are saved to §/MYWORDS, Hayden: Speller will compare the document against it every time it spell checks a document. If the words are saved to §/FILENAME, Hayden: Speller will only check it if specifically instructed to.

Other goodies included in Hayden: Speller are (1) allowing you to save your corrected document under another name, or (2) editing user created dictionaries with your word processor.

The manual: Hayden: Speller comes with a 54 page manual that includes a two page index. The manual is broken into two main sections. The first part is an introduction and complete tutorial. The second part is a reference manual that covers each command in detail. The program is so simple and straight forward to use that after using it once or twice you will never need the manual again.

Protection: Hayden: Speller comes on a protected disk. Its protection method is the master disk test. Using Macintosh's standard disk copy method, you can make a copy of it. When you attempt to use the copy you will get a dialog window instructing you to insert the master diskette; insert it and the program verifies it is a master diskette. The master is then ejected and you reinsert the copy. The copy will then work and you do not have to reinsert the master diskette so long as disk icon is on screen. Backups are available for $10 provided the registration card that comes with the disk is returned. Upgrades will be available for $5.00.

Limitations: Hayden: Speller is not without some limitations. It works fine with MacWrite, version 2.2, standard Macintosh text documents and most Microsoft Word documents. I say "most Microsoft Word documents" because I have noticed with very long files, usually over 30K, it has the tendency to lock up. On three different files, I got an error message that it could not open the file. Yet when I went back to Word and saved those files as text files on-

Continued on page 78

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The Mac Brings Computers To The Comics World

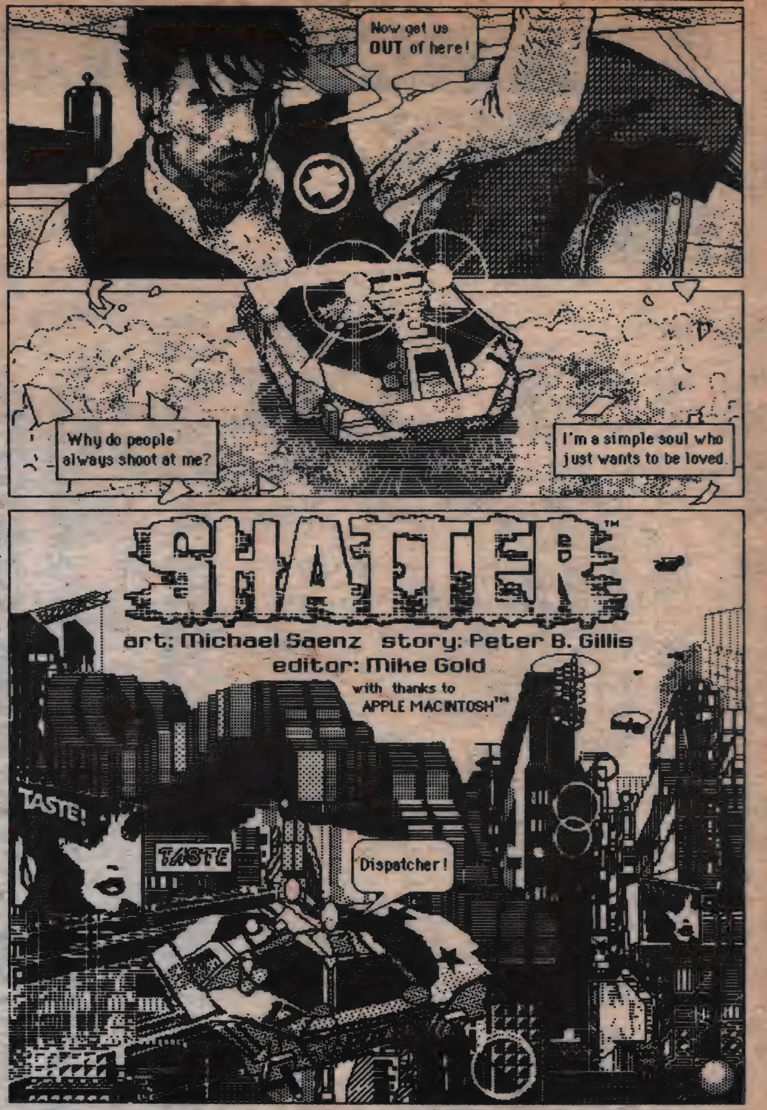
by Barbara E. and John F. McMullen

Apple's Macintosh, through its innovative use of graphics, has opened up whole new arenas for computers to make parade in. One of these arenas that we found to be particularly interesting is in the production of a new comic book where the Macintosh is the total artistic tool used. The book, "SHATTER", produced by First Comics in Chicago, is the first comic to utilize the artistic attributes of a microcomputer and, from an inspection of the first issue, we suspect it will not be the last.

Using the Macintosh to produce SHATTER is a result of independent purchases of Macintoshs by Mike Gold, Managing Editor of First Comics, and Michael Saenz, a Chicago-based graphic artist. Both rapidly fell in love with the Mac and saw the great potential of its graphics capabilities in comics design. Their preliminary discussions on how the Mac could be used in such a fashion rapidly evolved into a creative and business plan for using the computer as the sole development tool for the new comic.

"SHATTER", created by Saenz and writer Peter B. Gillis, is the story of a 21st century policeman who is sometimes referred to as "Shatter" (his name is actually Sadral-din Morales but is known to his police employers as Jack Scratch). The environment in which the hero is set is a heavily computerized world where all jobs are temporary and subcontracted for as needed (Jack Scratch is real-

Continued on page 80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Hayden Speller

Continued from page 74

ly, Hayden: Speller would read and proof them. Furthermore with Word, the file must end in a carriage return. If it does not, Hayden: Speller will proofthe file but Word will be unable to reload it.

Hayden: Speller can handle files that contain no more than 1500 different words. Unless you write very large papers, this is no concern. Based on my experiences, a file has to get larger than 35 pages before this becomes a problem.

Finally, the program has poor error trapping in places. For example, after proofing a large file and making numerous corrections, I tried to save it. I got the error message "Sorry, there are too many corrected words. Please save the changes, then quit and rerun Hayden: Speller." To remove the error message I had to press RETURN or hit "OK" in a dialog box. I did so. The disk drive would whir for a few seconds and then the same error message would appear. This went on in an never ending cycle until I rebooted the computer.

Conclusion: I have absolutely no hesitation in recommending Hayden: Speller. Unlike many programs, it does a job and does it well. Its ease of use, powerful features, and ability to create specialized dictionaries should make this a best speller.

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Hard Drives And The Mac

by Philip Chien

One of the major advantages of the Mac is its 3½" floppy drive. The diskettes hold more information than the 5¼" floppies, and are faster and more durable than their ten-year-old counterparts. One of the disadvantages of the Mac is its 3½" floppy drive. A Mac floppy can only store a 2500 name mailing list, and takes over 15 min. to load it. Many Mac users are now outgrowing their floppies, and looking at hard drives as alternatives.

Hard drives are faster, and store more than their floppy counterparts. (Actually the term "Floppy" is a leftover from the days when the media in diskettes was a flexible piece of plastic. The media in 3½" diskettes is rigid.) The media in a hard drive is sealed within a controlled container. Dust, magnetic fields, fingerprints, and other contaminants are kept out. Where a floppy disk spins at about 300 RPM, a hard drive spins at over 3000 RPM. (Over 100 times faster than a standard LP record!) Since the magnetic media spins so quickly, a hard drive is more delicate than a normal floppy drive. A 5g shock (dropping one end of the drive 30cm (6") will destory the drive surface, and all warranties involved. Unfortunately, since the media in a hard drive mechanism must be kept enclosed, the media can't easily be ejected or filed like a floppy diskette. (Also one of the reasons hard drives are also referred to as fixed, or non-

Continued on page 84

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Mac Brings
Continued from page 78

ly the name of the individual who subcontracted his police position to the hero).

The trio responsible for SHATTER all have extensive backgrounds in the world of comics and have integrated computers into their professional lives. As mentioned earlier, Saenz, a well known "air brush" artist whose work for Marvel Comics (particularly for their adult fantasy magazine "EPIC") and "HEAVY METAL" magazine has brought him a significant following, had his own Mac while Gillis, who has written extensively for Marvel Comics (most notably the "NEW DEFENDERS" and "MICRONAUTS"series), was utilizing an Apple III for his scripting work. Gold had, previous to his purchase of the Mac, installed an Olympia "PC-clone" for First Comics' administrative work (this work is presently being transferred to the Mac). It is certainly not surprising with this collective background that the idea of totally utilizing the Mac developed so rapidly.

The use of the Mac did not change the way in which a comic is developed (for those unfamiliar with the process, the normal creative cycle involves the writer developing a plot which is turned over to a "penciler" who draws the actual comic based on her/his interpretation of the plot. The penciled illustration is then returned to the writer for insertion of dialogue and captions). The Mac merely provided different tools for the creative talent to use. Saenz used "MacPaint" and, to a lesser extent, "MacDraw" as his software for the magazine's artwork which is totally (including coloring) produced on the Macintosh.

Although Gold clearly feels that the product is important due to the innovative use of the available technology, "Nobody has ever produced and published a book like SHATTER". He is quick to point out that care has been taken to insure that the medium did not become the complete message. He feels that the story line is of comparable quality to that of the present seven First monthly and bimonthly titles ("Nexus", "Jon Sable", "Starslayer", "American Flagg", "Grimjack", "Elric" and "E-Man"). He stated that "First Comics aims at a more adult readership than most of the other comic publishers. With an average readership age of 24, we must be sure that our plots maintain a level of sophistication to interest the mature reader and for SHATTER to attain the level of our other books, it must be more than a novelty." With this goal in mind, First is introducing SHATTER both as a special booklength edition, which Gold feels will appeal to both comic readers and computer enthusiasts alike, and as a short-run eight page feature in one of its best-selling monthly publications, "Jon Sable, Freelance" where Gold says it will provide "the long-range storytelling capabilities of the Macintosh to comics fans and the sophistication of the comics medium to the public at large."

Even while pointing out the dedication to superior editorial content, Gold clearly recognizes both the importance of the use of technology and the related publicity value - "In the mid-1980s, computers are the cutting edge of graphic art and design and a great many people want to see the development of this medium." ..."SHATTER" will bring Apple a whole new audience -- artists, designers, animators, art directors and people involved in other graphic storytelling media. Its impact on the so-called comic art medium is going to be enormous." ..."Simply put, this is something that has never been done before."

The booklength SHATTER is available at more than 3,000 comic book speciality stores and at selected computer and college outlets at a newsstand price of $1.75. Individuals who cannot locate SHATTER can obtain a copy by sending $2.25 to First Comics, Inc., 1014 W. Davis Street, Evanston, IL, 60201. ●

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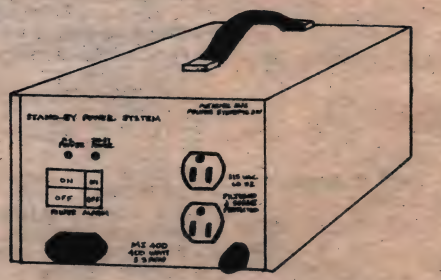

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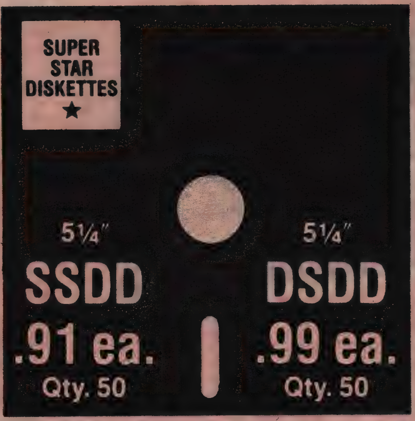

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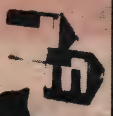

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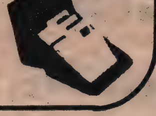

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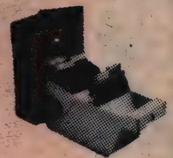

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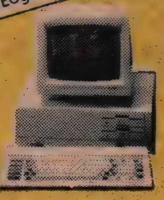

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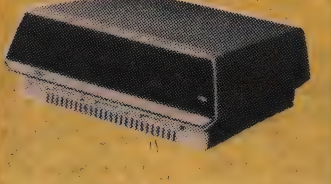

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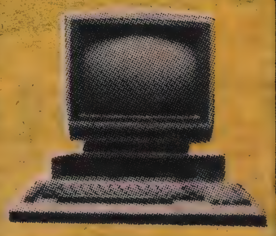

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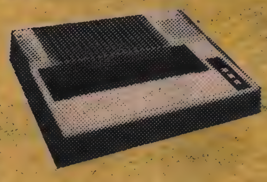

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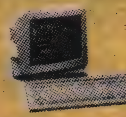

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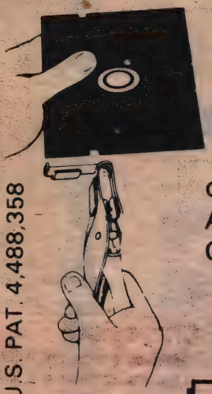

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Hard Drives
Continued from page 80

removable). Backup of hard drives is a major problem. In the early days of hard disks "disk crashes" (as bad as the name sounds) were common occurences and data had to be reconstructed often. Present manufacture and inspection techniques have made disk crashes a rare occurence now, but backups are still important. Power glitches can erase information, programs can scramble data, and of course no improvements will ever get rid of human error.

There are a variety of different backup methods, each with its own advantages and disadvantages. The floppy diskette is the least expensive and most cumbersome backup method. A ten meg (ten million character) hard drive stores as much information as 25 floppy diskettes. It can take over an hour to backup or restore the drive, and a human operator must sit by the machine to exchange diskettes.

Another backup method is videotape. The Corvus "Mirror" backs up information from hard drives onto normal home videotapes. Over a meg a minute can be stored with this method, and home video recorders and tapes are fairly inexpensive. The only major disadvantage of the videotape backup is that the video recorder must be manually controlled. An operator must press the controls on the video recorder.

A more "professional" tape backup is a streaming tape drive. This is a special magnetic tape drive designed for computer use. A tape cartridge (about the size of a small paperback book) is used to store the data. The major advantage of the streaming tape over the videotape is control. The backup tape drive can be started, rewound, recorded, and restored all under program control.

Another somewhat more versatile method of backup is a disk cartridge. This type of hard drive is usually sold as a "10 meg fixed 5 meg removable drive" (or some other combination of memory). The 10 meg portion is a normal hard drive, and the 5 meg portion is a cartridge with a fixed media inside. Naturally, the major advantage here is that you can have 15 meg online, instead of the normal 10 meg, and changing different sets of data (e.g. different accounts, your archival backup data from a year ago, etc.) is as easy as changing the disk cartridge. The major disadvantage is (you guessed it) cost. The removable cartridges don't come cheap. If you need to make periodical archival copies, a removable cartridge will not be cost effective.

Using a hard drive without a backup device is like using a car without a spare tire. You can get away with it, and PROBABLY not have any problems, but I wouldn't want to take a long trip with you.

Naturally getting a hard drive is not as simple as just plopping down the money and purchasing it. The major difficulty a Mac user has with a hard drive is software compatibility. A few programs will not work with hard drives due to incompatibility with the hard drive's Input Output Subroutines. Others will not work due to copy protection schemes. Many copy protected programs will work with hard drives - but - the original program diskette still has to be placed in the Mac for various key operations. Before buying a hard drive, check to see how your programs will operate on it. After buying one, make sure that future software you purchase is compatible with your drive.

Even if your software works perfectly with your drive, you may run into the limitations of the Macintosh's Finder (operating system) program. The Finder program was designed with the 400K floppy, and assumes that there won't be more than about one hundred files on any given drive. Unfortunately, on a hard drive it is very easy to have several hundred files. Many hard drives get around the problem by splitting up the hard drive into separate folders. Each folder is still limited by the Finder, but you can have as many folders as you need. Fortunately this problem will disappear later this year. Apple Computer is coming out with a new version of the Finder program which will support more files.

Apple introduced the Macintosh as a machine for the businessman and home user

Continued on page 85

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Hard Drives
Continued from page 84

who didn't want to learn how to use a computer. Part of this design philosophy dictated that the attachments to the outside world should be as simple as possible. There are no expansion slots, no bus structure, and the only user devices allowed are attached to the Mac via DB connectors on the back of the Mac's case. External I/O devices (besides the keyboard) would be limited to a mouse, an external disk drive, and two RS-232/RS-422 ports (to be used for modems and printers). Naturally, the inside of the case is off limits to the end user, and opening the case will cause volcanos to erupt, earthquakes to form, and void various warranties. Unfortunately, while this design structure has made the Mac the easiest computer to setup and use, it is not the easiest design to attach a hard drive to. Nevertheless, almost all of the ports have been used by hard drive designers. (As of this date I have yet to see a hard drive designed for the mouse, or keyboard connector, but it's not impossible, and it it's not impossible, then somebody is probably working on it.)

The Apple RS-422 ports are somewhat more powerful than standard RS-232 ports, and most hard drives for the Mac are designed to attach to the Mac via either the printer or modem port. Unfortunately you can't plug three items into two sockets. so if you want to use a printer, a modem, and a hard drive, you will have a slight problem. Several hard drives have output ports as well as input ports which help solve the problem. You attach the hard drive to your modem port, and your modem to the hard drive. The hard drive's I/O routines include the proper modifications to the modem port I/O routines for programs to access the modem port on the hard drive. Naturally there are programs which won't work with this setup. At least one drive is designed to be attached to the printer port, and has an output port for a printer. A portion of the hard drive's memory can even be set aside as a print spooler to enhance the throughput of the printer.

Besides the I/O ports, various hard drives attach to the Mac via the external drive port. The hard drive looks like a normal external Mac drive - except instead of only 400K available, several megabytes are available. Some hard drives designed for the external drive ports also have output connectors, so an external Mac drive

Continued on page 86

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Hard Drives

Continued from page 85

can be attached.

It seems that there is no other place to attach a hard drive, but there is. General Computer's Hyper drive attaches directly to the Mac's 68000 processor. The motherboard is modified, and the hard drive is attached inside the Mac's case. A variable speed fan (the hotter it gets, the faster the fan turns) cools the hard drive and the Mac. The major advantage of the Hyper drive is speed. Since it is connected directly to the microprocessor, it can access memory much faster than externally mounted drives. Another advantage of the Hyper drive is its direct boot capability. With most hard drives, you must boot a floppy diskette with the proper driver routines to use the hard drive. With the Hyper drive, you can boot a normal floppy if you wish, but if you don't insert a floppy into a Hyper Mac when you first turn it on, the Hyper drive boots directly! The major disadvantage to the Hyper drive is that you lose all Apple warranties on your Macintosh. General Computer offers its own warranty plan which covers the same period which normally would have been covered by Apple Computer, but many users desire an original factory warranty. Besides the warranty problem, Hyper Mac owners should realize that the Mac must be treated more gently (to aovid harming the drive), future software enhancements from Apple, and other companies, may not be compatible with the Hyper Mac, and a Hyper drive cannot be expanded beyond the standard 10 meg upgrade.

Hard drives are somewhat more sensitive to power requirements than their floppy counterparts. Before shutting down a hard drive, the read/write heads should be moved to a safe portion of the drive where they won't accidentally change data. (A procedure referred to as "Parking the heads"). Power glitches can be disastrous to hard drives. If a hard drive is writing a directory or boot track when the power fails, all of the data on the drive can conceivably be lost. Where I live, in Central Florida, power glitches happen on the average of once every couple of days. Florida Power and Light (also referred to as Florida Flash and Flicker) has caused me to lose several hours of typing, but at least they haven't destroyed my hard drive - yet. A surge protector is an absolute necessity when using a hard drive, and an uninterruptable power supply should be seriously considered when the data is important, or where the power company is unreliable. (Yes, the Kennedy Space Center Launch Control computers ALL have uninterruptable power sources). If you have a reliable power source (no power glitches, dropouts, or surges, no lightning storms, or a reliable backup uninterruptable power source), then you should leave your hard drive running all of the time. Hard drive mechanisms are designed for 24 hour operation. Each time you shut off and turn on the drive compounds the possibility that the heads may damage the drive surface. As long as you have a good power supply, leave your hard drive running.

A hard drive is an excellent, although expensive, add-on for any serious computer user. With a little shopping around, and examining features, you should be able to find the hard drive with the features you need.

The following is a list of the most important features to look for when shopping for a hard drive for your Mac:

* expandability (can you expand it beyond the size you originally buy?)

* backup (does the drive come with a backup device, and how much does it cost?)

* cost per Meg (Million characters) of memory.

* compatibility with programs you use.

* speed (usually referred to as data transfer rate, and expressed in thousands of characters per second)

* reliability (usually expressed as MTTF (Mean Time to Failure). It should be at least 10,000 operating hours)

* and of course, warranty and support.

The following is a partial list of companies which have released or announced hard drives for use with the Macintosh:

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2100 Corvus Drive (ouch!)

Continued on page 200

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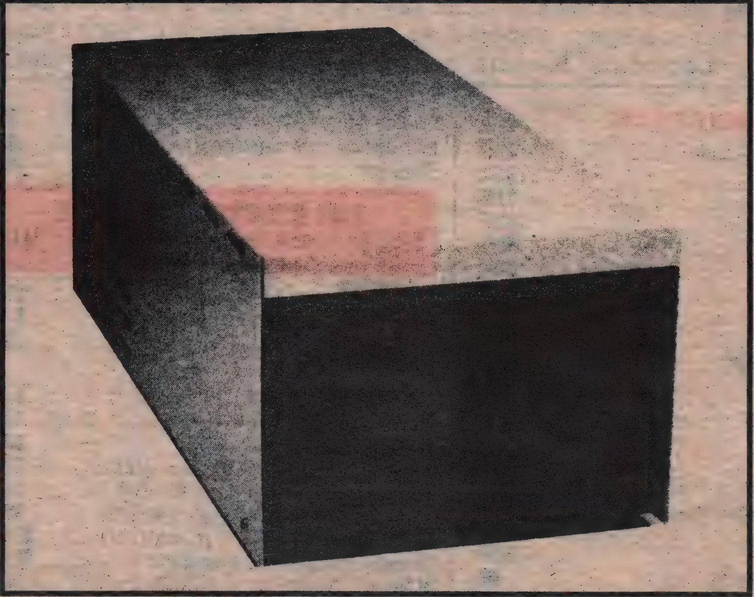

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Continued from page 44

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Hryniak's note to Ability users concludes, "We are glad not to have installed an anti-piracy procedure. It would have made Ability more difficult for you to use. We believe we have made the right decision."

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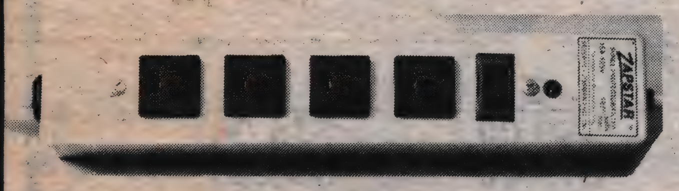
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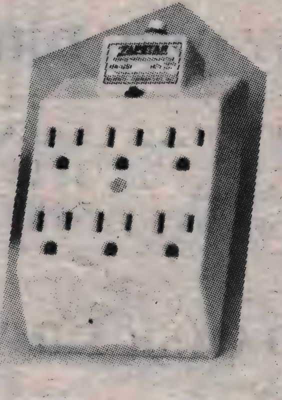
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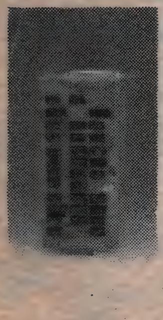

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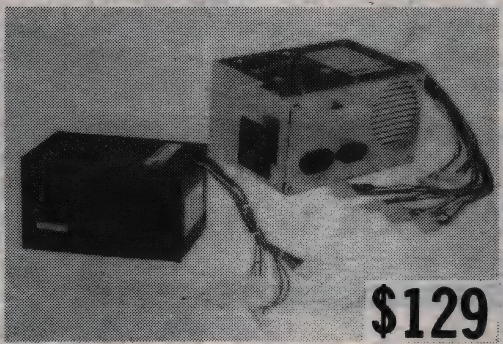

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- 4 Drives Power Plugs
- Side Switch model has some dimensions & power plug as IBM power supply.
- Back switch model can fit Mega case perfectly.

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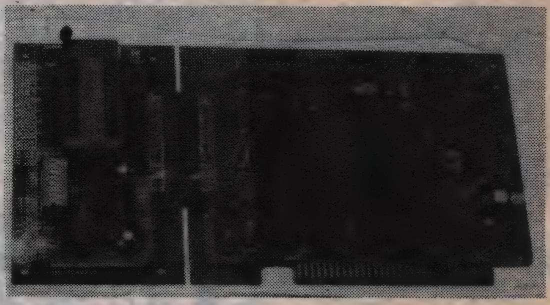

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2732	32 Sec.
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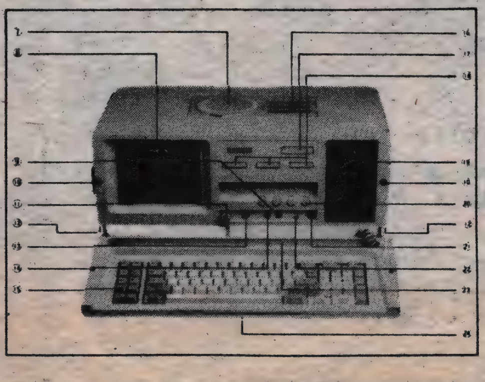

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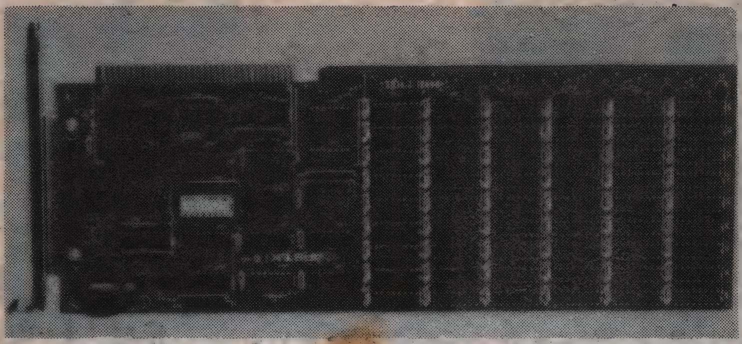

Apstek, Inc. a manufacturer of multifunction, memory expansion and I/O boards has introduced Handi 2 Plus to its product line.

Handi 2 Plus, designed to complement more sophisticated software packages, provides for 384K of memory expansion, with a clock/calendar function. The board can be configured in any increment of 64K from OK to 384K. Included also with the board is the Handiware Software package which allows the end user to set up four electronic disk drives, perform print buffering and run a series of diagnostic tests.

Handi 2 Plus with OK will retail for $219. Fully populated with 384K, the Handi 2 Plus will retail for $639.00. These boards are made available from Apstek, Inc. and its nationwide distributors. For more information, phone your local dealer or phone Apstek, Inc. (214/357-5288) for the dealer closest to you.

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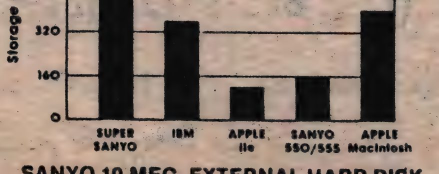
COMPARISON OF DISK DRIVE STORAGE



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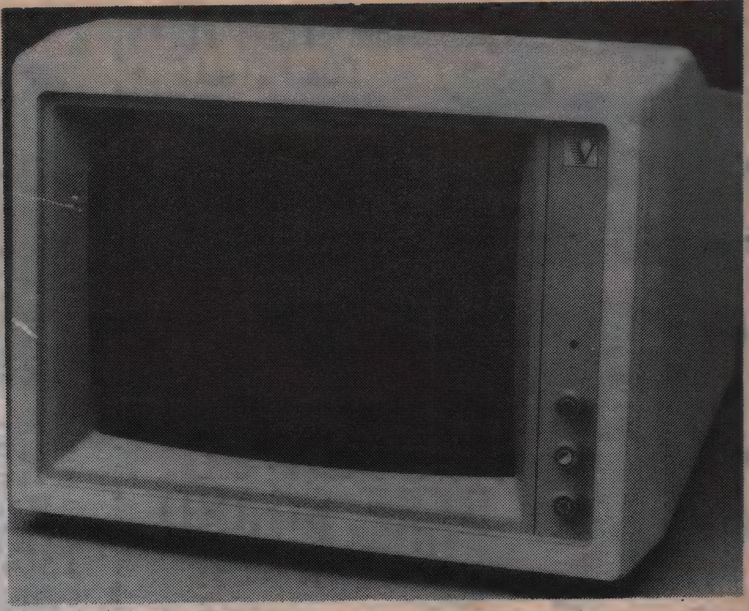
Verticom Continued from page 44



also provides emulations for Tektronix 410x series color terminals and a DEC VT100.

"With the introduction of the IBM PC AT, it has become apparent that a high performance graphics controller would be needed that would make the PC/AT a dominant low-end graphics workstation", said Gerry Moneypenny, Verticom's Vice President of Marketing. "Obviously, the PC AT will encourage higher performance micro applications, and Verticom's products are ideal complements to the PC AT."

These new announcements are targeted for markets such as CAD/CAM, CAE, Scientific/Engineering, Business Presentation Graphics, and Graphic Arts. Retail prices for the controllers range from $2,250 to $2,850. The graphics display is $1,025. OEM prices are available upon request.

Verticom, Inc. designs and markets high performance graphics controllers and displays. These products are designed for the Personal Computer marketplace. Verticom markets its products through OEMs, systems integrators, and dealers.

For information, contact Verticom, Inc., 545 Weddell Drive, Sunnyvale, CA, 94089, (408)-747-1222.

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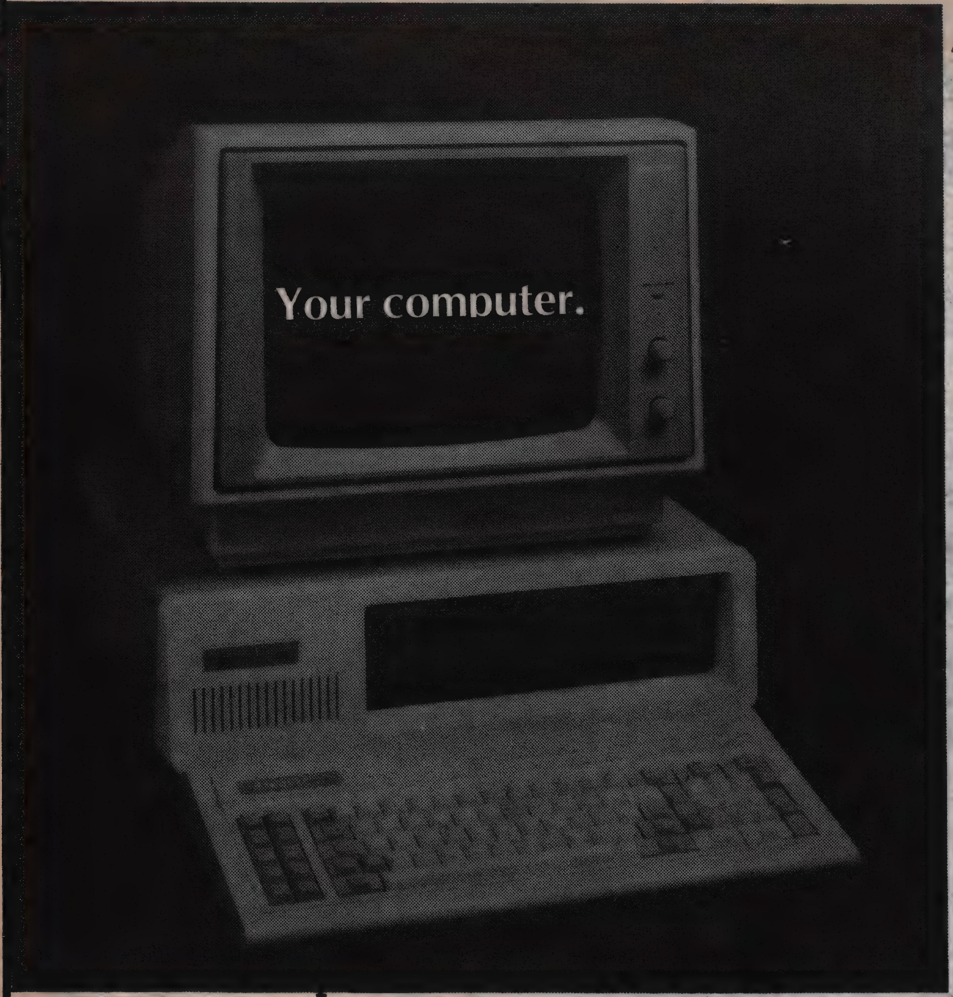

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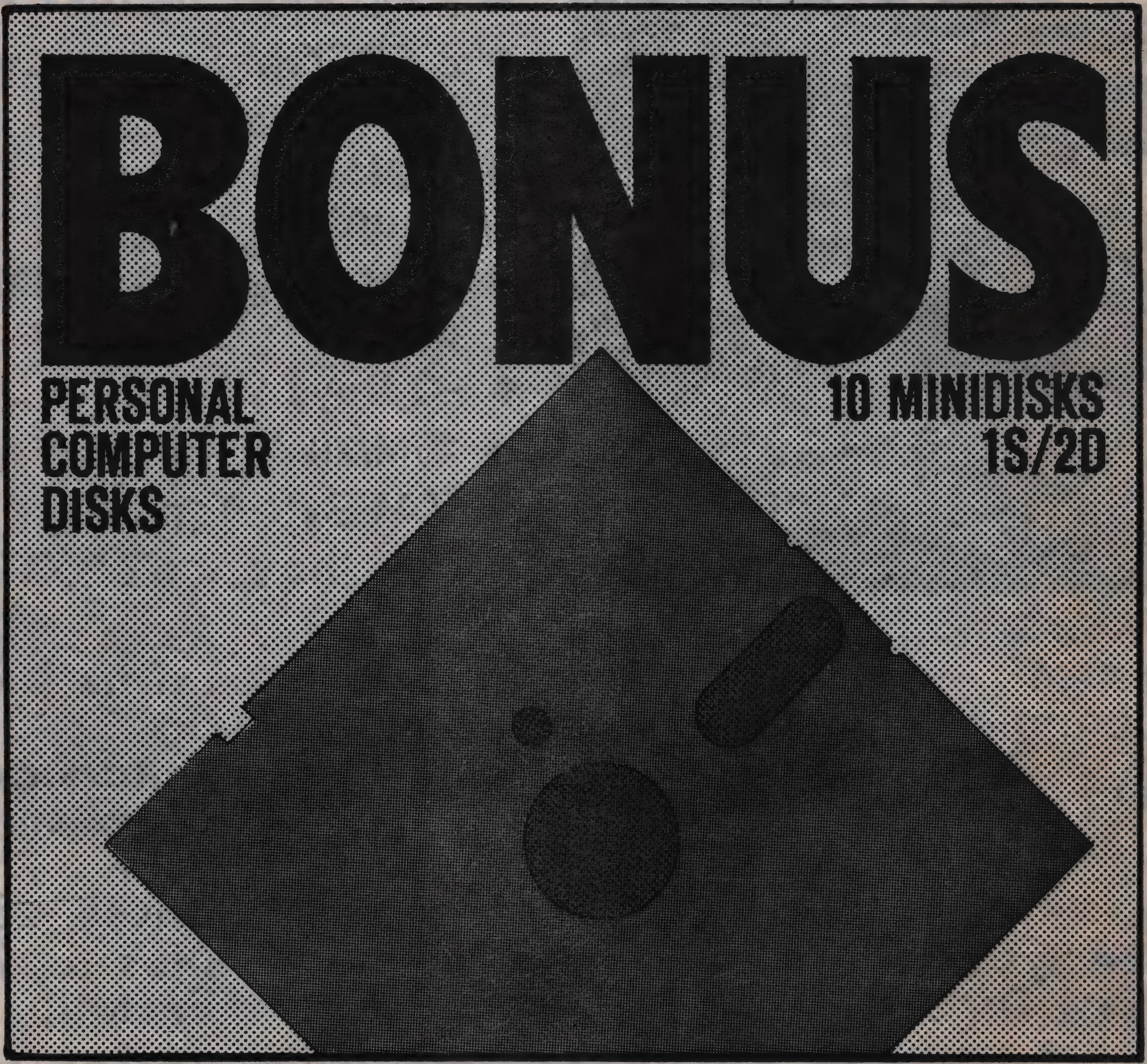

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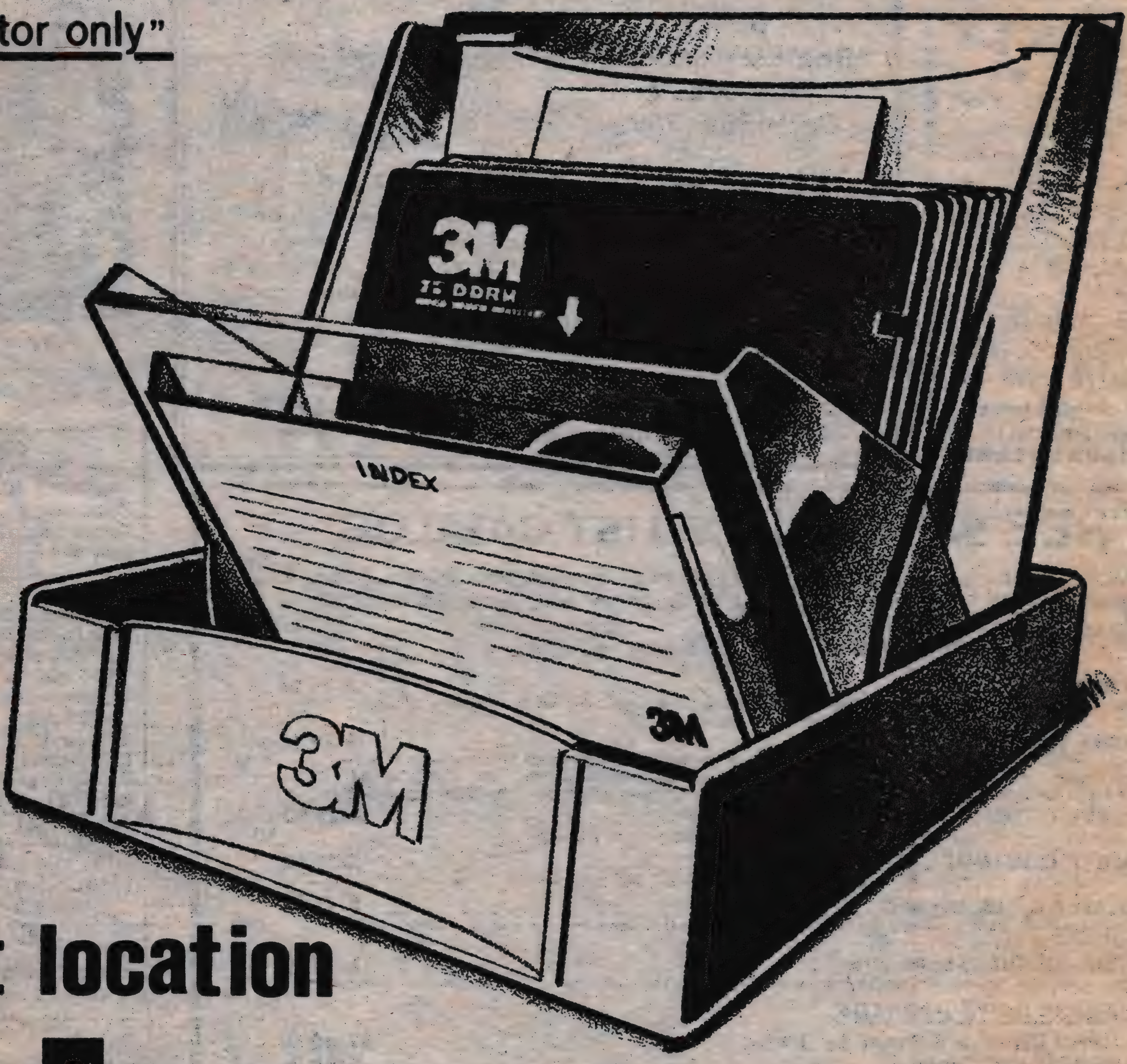

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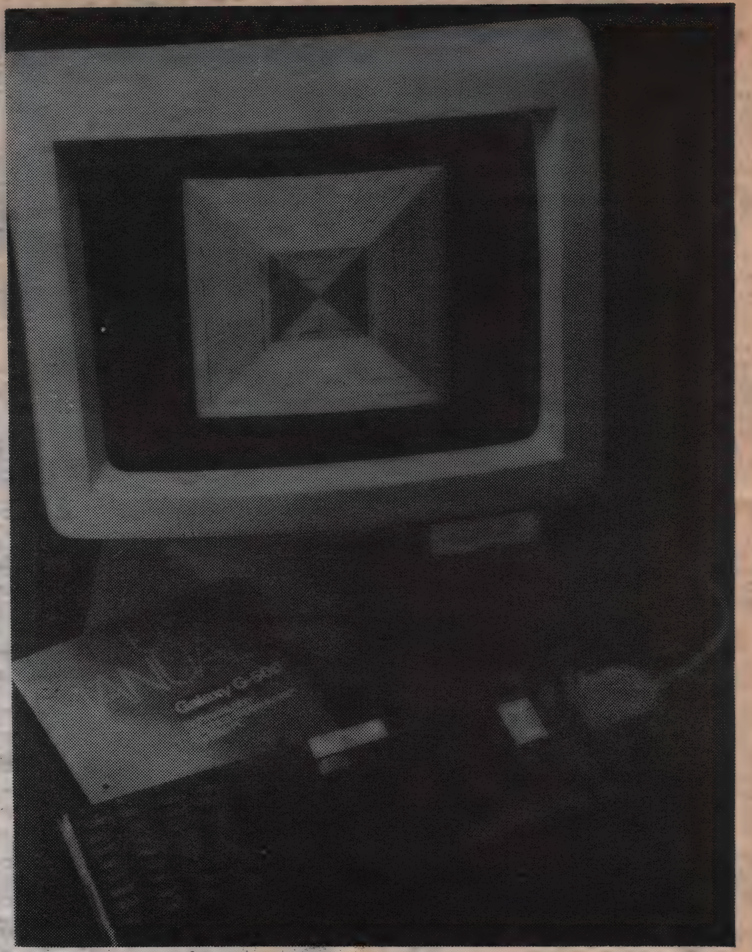
Electric Dragon Continued from page 43

has its own Judgment and Interpretation. Select any one by number, and the hexagram is displayed on the upper left corner of the screen; in the upper right corner of the screen is the question box, and beneath them appear the Judgment. By using the cursor movement keys, you can browse through the several pages of interpretation, then continue with The Image, an advanced interpretation by Confucius. Further scrolling takes you to The Lines, where each of the six lines is highlighted and interpreted. HOME takes you back to the beginning, and END returns you to the submenu, where you may select another for study, or return to the main menu.

Continued on page 198

Graphic Display Continued from page 44



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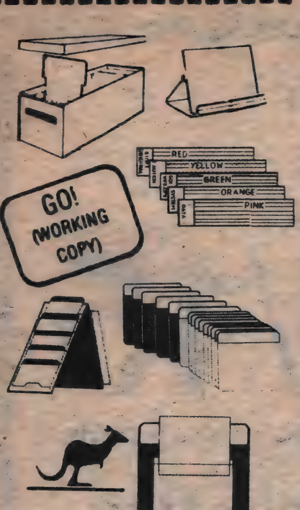

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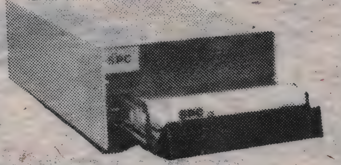

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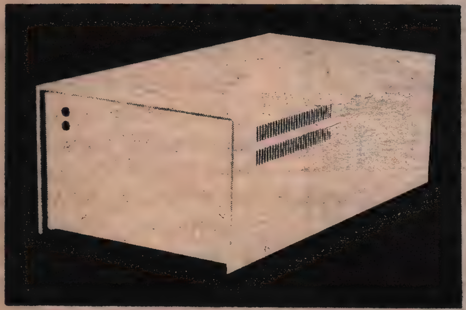

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Apple IIc

Continued from page 41

selected settings.

However, this disk will only work with the ProDOS operating system (not the more- common DOS 3.3 that has been used with the Apple II series until recently). You'll have to boot-up with this particular disk whenever you intend to use your printer, or the port settings will be incompatible with your printer. Frankly, this is a terrible arrangement!

Configuration Ala Keyboard

There is, however, another way to reconfigure either Port # 1 or Port # 2, using the keyboard. This is a temporary change, and must be done before the printer is first used, but it's fast and easy (although it may confuse you initially.)

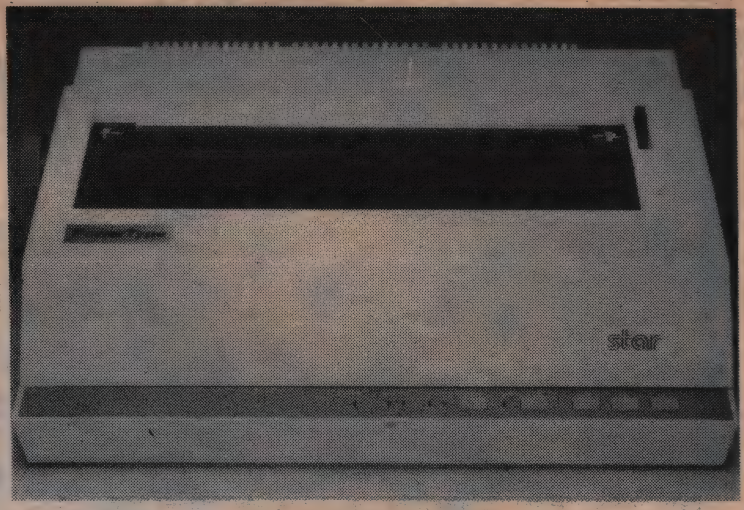
I'll describe the procedure for Port # 1 first (since that is the port normally used with a printer), then will cover the almost-identical procedure for Port # 2.

Changing Port – 1

First you must get the attention of Port # 1. You do this by typing "PR#1" (without the quotes) from the keyboard, or PRINT CHR$(4);"PR#1" (with the quotes) in a BASIC program.

The "control/I" key combination (hold down "control" and press I) signals the computer that you will be following with a Port # 1 configuration command. Table 2 shows just some of the commands that can now be issued from the keyboard to change the configuration of Port # 1. If you require an explanation of these functions, you shouldn't be using them!

For example, suppose you wanted to use a printer connected to Port # 1 that was set to 1200 baud, 7 data bits, 1 stop bit, and no parity. Since the default setting of Port # 1 is 9600 baud, 8 data bits, 1 stop bit and no parity, you need to change the Port # 1 settings for baud rate and number of data bits.



Star Micronics Inc.'s Powertype Daisywheel Printer

Boot-up the Apple IIc and turn on your printer. Type PR#1 and press "return". While holding down the "control" key, press I. Release "control" and press the I key to echo your typing to the screen, so you'll be able to see what you're doing. Now use "control/I" followed by 8B for 1200 baud. Now "control/I" followed by 1D changes to a 7-bit data/1 stop bit word format. Done!

Ignore any beeps, question marks or error messages. The Apple IIc hates to have you circumvent the more sophisticated System Utilities disk, but will accept this method nevertheless. These port settings will remain in effect until you either turn off the Apple IIc or address another PR#

You exit back to the screen with either "control/I" and R, or PR#0 and "return". The port configuration will return to the default settings of Table 1.

While this may seem confusing to you, it is very simple with a little practice, and allows you enormous flexibility when testing different printer/Apple IIc interface settings. At best, RS-232C serial interfacing is confusing and frequently gets into a cut-and-try approach. This real-time keyboard configuration capability can be an immense interfacing aid.

Changing Port – 2

The same procedure can be used to reconfigure Port # 2, with only two changes. PR# 2 (instead of PR# 1) is used to pre-address the commands to Port # 2, and "control/A" (instead of control/I") is used as a prefix to all configuration commands. The individual command codes are the same as for Port # 1. Now you can run a serial printer from Port # 2, if you like (or reconfigure Port # 2 for a 1200 baud modem) without being restricted to ProDOS and the awkward, slow System Utilities disk.

Configuration Ala BASIC

There are times when you may wish to have your printer called from within a BASIC program. This is normally done with the PRINT CHR$(4);"PR#1" statement. The CHRS$(4) is "control/D" on an Apple IIc, needed to alert the computer that a DOS command is coming next. But how do you address each port with the "control/I" or "control/A"? Well, it turns out that CHR$(9) is "control/I and CHR$(1) is "control/A" on an Apple IIc.

Therefore, if you wanted to have a BASIC program configure Port # 1 for 1200 baud,

Continued on page 194

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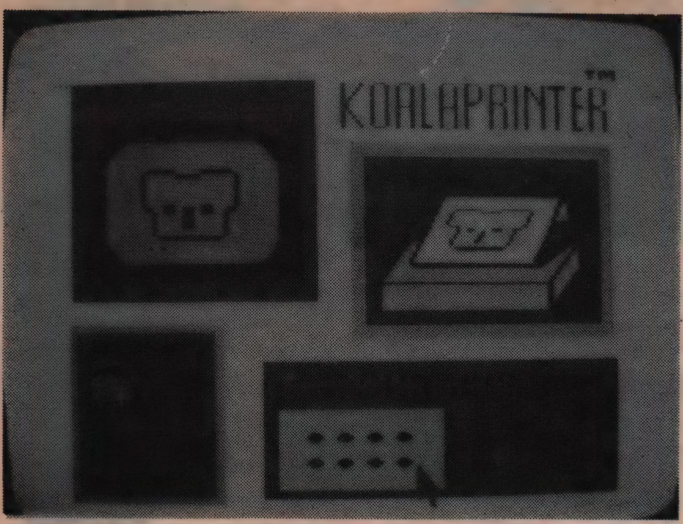

by Cheryl Peterson

The Koala Pad is a drawing pad that plugs into the joystick port of the Commodore 64 and allows you to create pictures in any of the 16 colors the C-64 on display. The Koala Painter program, which comes with the pad, enables you to choose colors, paintbrushes and figures to create on the screen. Using a stylus (provided with the pad) or your finger, you can "paint" just about any picture you could draw with pens and paper. Of course, your drawing is limited to the screen display, unless you purchase the Koala Printer program.

The pad worked flawlessly. When the pad is touched an arrow appears on the screen to indicate the current cursor position. Moving your drawing instrument around the pad also moves the cursor. I really enjoyed being able to just draw and have the result show up on the screen.

Two buttons at the pad's top are used when you need to choose a menu option. You indicate your choice by pointing to the option and hitting either button. You can also use the buttons to designate points on the screen. This comes in handy when you perform a function requiring several steps.

I had only a slight problem with maintaining contact between the stylus and the pad. If you let up on the pressure even slightly, the cursor jumps to the nearest corner and fills in a pixel. When you increase the pressure it comes right back, but after awhile you get a little square of color at the corner. It doesn't take much to get rid of it, though. That is probably the only complaint I can make.

The Koala Painter (KP) program resembles Micro Illustrator (MI) from Tech Sketch, so much so that they could be non-identical twins. (See main menu photo.) A review of Micro Illustrator and the Tech Sketch Light Pen appeared in the January 1985 issue of **Computer Shopper.** There are a few differences worth noting, however. (A feature by feature comparison is available at the end of the article.)

First, KP has 8 brush patterns to MI's 10, so its not quite as flexible, there. However, KP has a couple of features that really make up for it.

One is the exchange color (X-Color) command. You choose the color you want to change some of the pixels to and then go to your picture. When you point to a dot of a particular color and press the pad's button, all the other pixels that are the same color change to the new color. With this feature you can change the background color, or any other shading to a new color. This is a dangerous, but powerful command. If not used properly, you could do a lot of damage in a little time.

Of course, there's always the

Continued On Page 182

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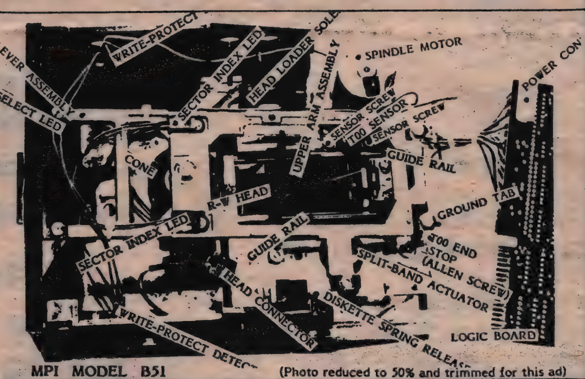

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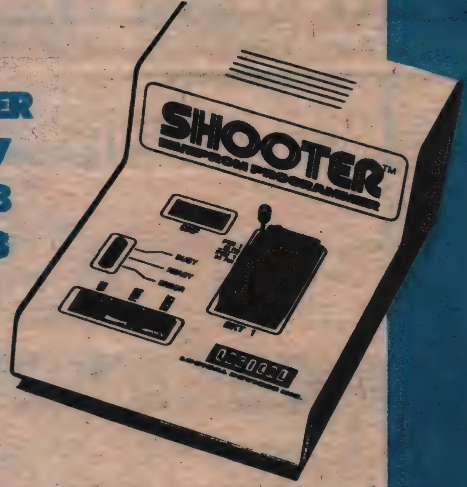

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Print Shop

Continued from page 47

the messages in your signs. There are also a graphics editor and the setup feature.

Easy To Use

One of the nice features of this program is that it is menu driven with screen oriented editing where necessary. All of the menus work the same way the main one does, using the arrow and RETURN keys to make your choices. However, when you are laying out the writing to appear on your creation, the program gives you a modified full screen editor. The arrow keys will work within each line and usually will allow you to go up and down, as well.

Another great advantage to the program is its ability to back up. If at any point in your design (up to starting the printer running) you decide to change something, the back arrow key will allow you to page back through and change the mistake. Further, after you've made the change the program remembers all the previous choices you made and displays them as the default. So, if you only need to change one little thing, you can just hit RETURN until you get back to where you were.

There is also a Print Shop reference card that shows the different font styles, graphics and editing commands. The most important of the editing commands would be I, which gives you a help menu of commands available and how to use them.

When you are at the menu to choose the font style, a box at the bottom of the menu show the font name written in the font's style. This makes it easy to decide which typeface to use. Similarly, you can put a border around the outside edge of the card and while in that menu the highlighted border surrounds the outside of the available choices.

Greeting Cards

The greeting card design is fairly straightforward. You choose a graphic to illustrate the front, indicate where and what size you want the graphic to be, choose the font for your message and lay out each line. There are eight different fonts and each is available in two sizes. The characters can be solid, outlined or 3-dimensional. After you've laid out the front, you do the inside the same way.

The program automatically limits the number of characters per line depending on the size and type of your chosen font. Each line on the card can be positioned in the center, flush right or flush left. Using this feature you can put a graphic on the right side and limit the writing to just the far left side, for instance. The program overwrites the illustrations, unless you limit the number of characters you use. This is a good feature though, because you can use the background patterns or graphics to make a solid design and then print over them with your message. The program will also center your message top to bottom, if you wish.

I should explain that the card only takes one pass to print. You don't have to plan out your illustration and then overprint it with your message. The program compiles all the instructions you give it to define a card, and then prints it up for you when you finish. (See the sample card printout, illustration 1).

As you can see from the printout, the card prints with the inside part upside down on the uppermost left of the sheet of paper. The front prints right side up on the lower right corner. If you've added a designer line, to let everyone who laid

Continued on page 100

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Print Shop
Continued from page 99

out the card know, it appears on the bottom left side. All this gets folded into a neat little card. Broderbund conveniently provides you an already folded card, so you can see how it's done.

There are several options for where to place your graphics, depending on the size you choose to use. They can be placed in the corners, staggered or tiled to make a solid background. Using the custom layout gives you more freedom in where you put the designs.

Graphics Editor

The graphics on my sample card was specially created using Print Shop's graphics editor. The graphics editor (also accessed through the main menu) is a great feature. You can create your own graphics, as I did here, or modify any of the 50 provided on the disk. Your modifications can then be saved on another disk for later use.

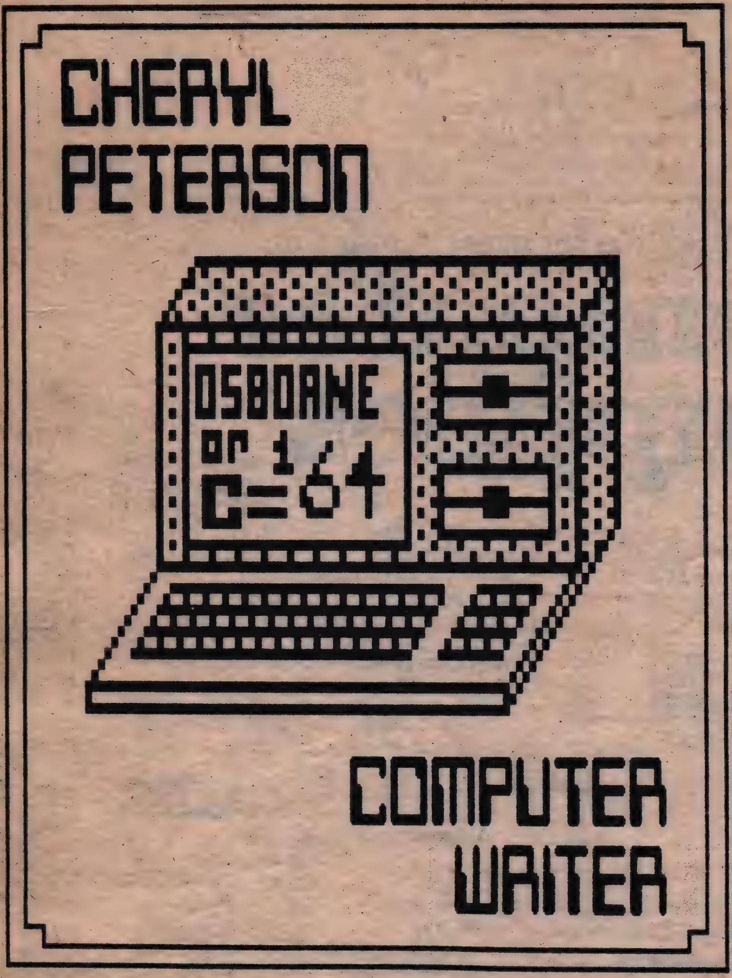
Although it isn't overly fancy, the graphics editor works well. The graphic is drawn on a large square that defines the border of the picture. You must "paint" or "unpaint" each block in the graphic. There are no functions to move the graphic around in the block, except by redoing each pixel individually. This means if you want to shift the whole picture to the left one row, almost every square must be changed.

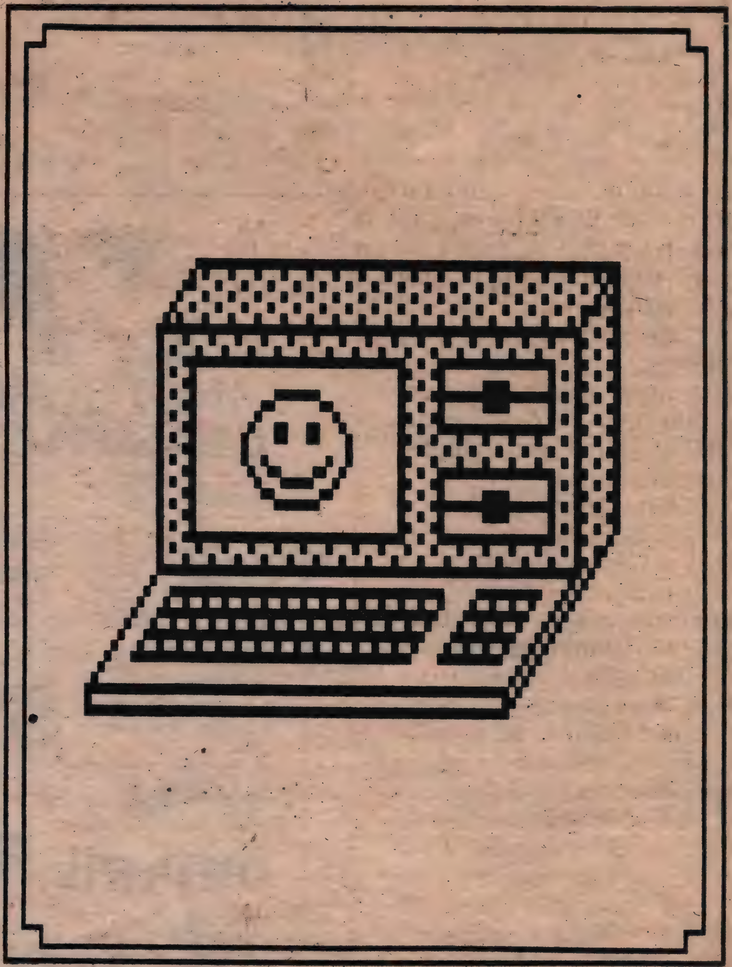
Outside of that, it works great! Pressing the fire button on the joystick changes the square at the cursor position to black or white. At any point, you can print out the graphic by hitting P. A C will clear the screen, so you can start over. S G (GET) loads in the graphic of your choice from the disk.

The programmers even added an option to turn on the joystick port so that you can use a joystick or a KoalaPad to move the cursor around. Press-

enables the save function and ing D lets you plug in a new device safely. Using the keyboard wasn't difficult; they use a standard diamond key pattern for moving the cursor.

Continued on page 102





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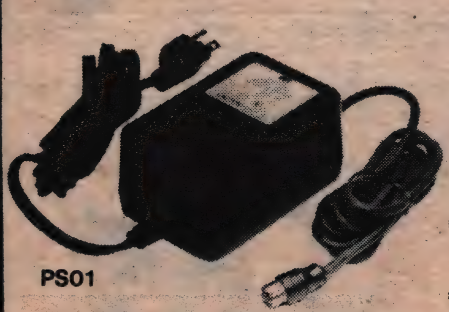

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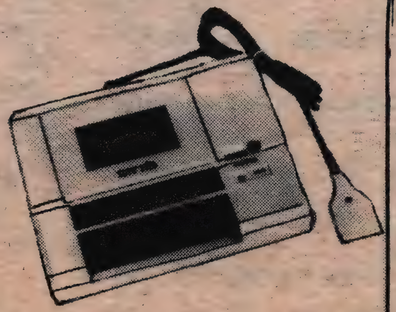

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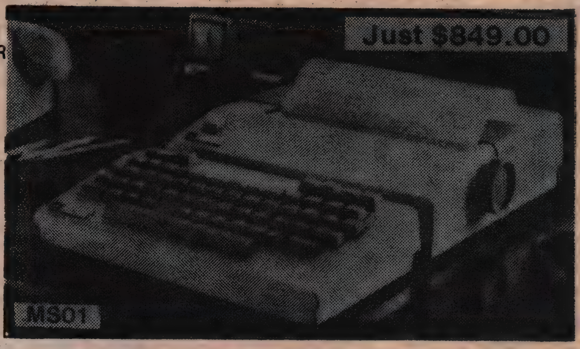

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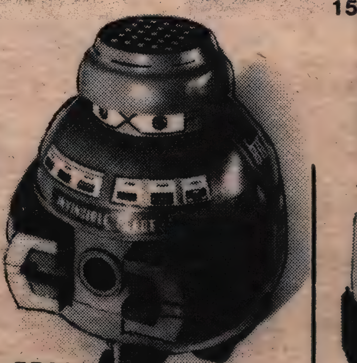

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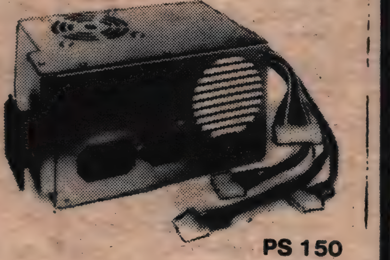

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Print Shop

Continued from page 100

Pressing D for draw and E for erase wasn't too bad either.

I found using the KoalaPad a bit difficult, because the cursor would jump around too much. The cursor movement control wasn't all that great using the joystick, either. The best combination for me was to use the keyboard to move the cursor and the two keys on the KoalaPad to color or uncolor the block. (See illustration 2).

Designing a sign (the second option in the menu) is rather like designing a larger version of the front of a greeting card. It takes the same commands but, as you can see from my sample (illustration 3), when they say large, they aren't kidding. The rose is one of the graphics provided on the disk. The signs are the size of a standard 8 ½ by 11 inch piece of paper. When doing signs you still have the option of small or large size type in whichever font you choose. The writing can be solid, outline or 3-D.

Screen Magic

Although screen magic is a separate option on the main menu, it works much like designing a sign. But first, you use the kaleidoscope function to create the sign's background. This part of the program displays randomly generated pictures composed of circles, lines and other geometric patterns. When you see one you like, you hit the pause key. You can then choose a font and layout a message to superimpose over the background.

Before printing, you have a chance to view the picture as it will appear on the printout. You may also save the background to disk for later use. Here, as in the graphics editor, you are given the option to format a disk before the save (just in case you don't have one handy, you won't lose all your work).

The screen magic option also lets you choose whether or not to put a plain black border around the outside. As with the other options, you can center the text top to bottom. An added feature here is printed in reverse video, if you wish.

Letterheads

The third option in the main

Continued on page 104

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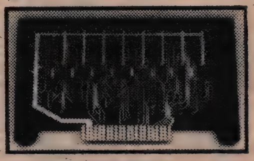

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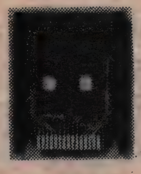

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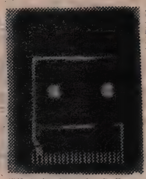

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Print Shop

Continued from page 102

menu lets you design a letterhead. You can use any of the graphics provided or one you've designed. The program allows you to put name and address information at the bottom or the top or both, using the font style of your choice for your name. This information can be set off from the rest of the page with a solid line if you wish. (See illustration 4). In my sample, I chose to use the bottom lines for advertising copy.

As you can see, Print Shop has the ability to print your graphics in different sizes. When printing a greeting card or sign, the illustration can be large, medium or small. For the letterhead, the graphic is always the small size. It can be placed in any - or any combination of - the four corners.

Banners

Don't you sometimes wish you could create a really nice looking banner? You know something like "Welcome Home Dad" or "Next Year Dolphins!" This is the program to do it.

Like the other options, you have to choose a font that you want your banner to be printed in. The letters can be solid or outlined. Then you type in your message. If you want a graphic to appear at the beginning, end or both ends, you have to pick it and tell the program where to put it. That's it!

The Print Shop starts print ing the banner horizontally on the page, the letters going top to bottom on the short length of the page. Because you can chain messages together, you can literally create a banner as long as you like. By chaining several shorter parts together, you can add in graphics anywhere in the middle or change fonts as often as you like.

More Good News

It is almost impossible to crash this program. The error checking is so good, it's unreal. If you have a graphics disk in and the program needs the Print Shop disk, a polite set of audio tones gets your attention while the screen message asks you to "Please insert the Print Shop disk and press any key when ready." If you try and fool it by not changing the disk, it just repeats the procedure until you do it right.

The program ignores irrelevant input at all menus. When designing creations, only the appropriate control codes are acknowledged. If you enter a line that is too long, it just ignores all characters after the last one that will fit. I couldn't crash it, short of turning off the printer.

Although it's only a minor flaw, the fact that you can't turn the printer off could be annoying. If you turn the printer off, the program will crash on you. It takes a few minutes to do it, but it will. I can't be too hard on Print Shop for this, because many other programs have this same problem. With most printers, it won't cause much of a headache. However, the fan noise on some others is enough to drive you nuts.

Printing

The printing section of the program has been very well designed, with only one flaw (the only major one I found in the whole program!) Once you start printing, there is no way to stop. There's a pause feature, so you can stop the printhead and let it cool down. But you can't stop the thing, short of powering down the whole system.

But some things almost make up for it. You can set the program to print as many copies as you like. A copy countdown is kept on the screen, so you can check periodically to see how many copies you have left to go. When it finishes printing, it comes back to the print menu, so you can print another copy, back up and make a few changes and then print again, or reset the number of copies and start printing again. There's even an option to make sure the paper is aligned properly in the printer.

The printout is not fast. You'll find yourself sitting around waiting for it to finish, so have a good book on hand. The finished product, however, is well worth the wait.

Broderbund offers a two-year limited warranty to the original purchaser. Return the disk to your dealer or to Broderbund with proof of purchase and (unless the disk has been physically damaged or abused) they will replace it free of charge. After the two year period or if the disk is damaged, Broderbund will replace it for $5 plus $2.50 shipping and handling.

Special Added Attraction

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Broderbund plans to offer additional graphics disks, one of which should be available for $24.95 by the time this article is printed.

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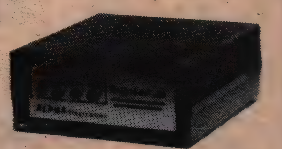

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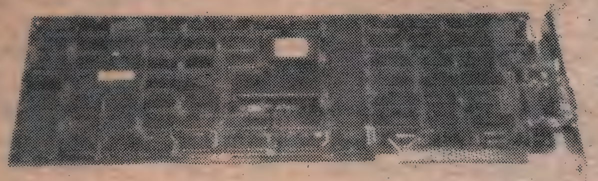

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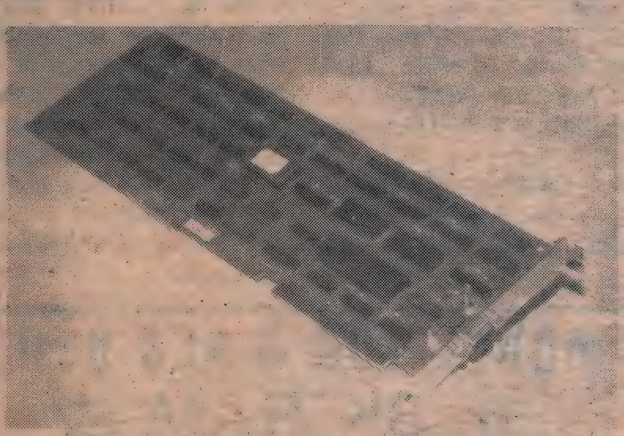

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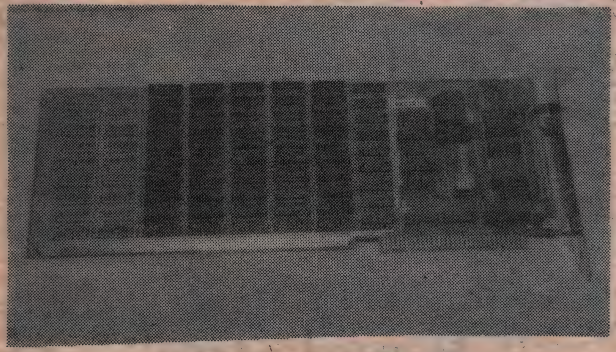

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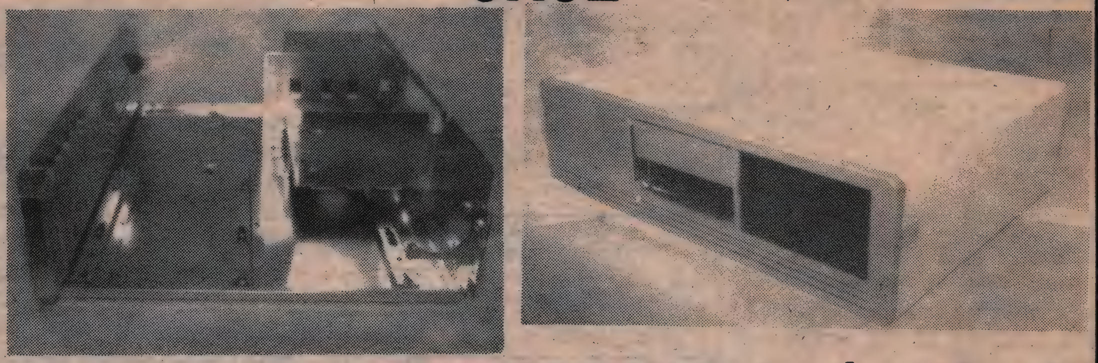

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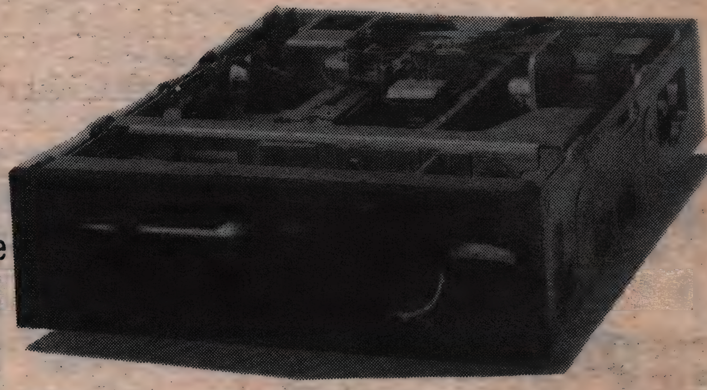

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How To Buy And Sell

Continued from page 59

for an individual to obtain information. For this purpose Computer Shopper may in the near future, publish lists of used computer prices. We would like input from our readers on this subject.

The Brown Book

The Brown Book is sold by subscription and is issued quarterly. The subscription price for 18 issues is $375 and it covers both computer systems and peripherals such as printers and monitors. A typical issue is 265 pages with 115 pages devoted to computer systems. Each section is arranged in alphabetical order and contains all the information about the unit and then gives three prices. The suggested retail price from the manufacturer, the average selling price which is the selling price taking into account discounts advertised in magazines and newspapers throughout the country. This is what the comsumer actually pays for the item. The final price given is "the Brown Book value" which is the pricing basis for financial, accounting, and trade considerations. It is the value of the equipment in good working order with documentation. In essence it is the Fair Market Value.

The one problem I find with the Brown Book is that it does not cover equipment that is older than 1980. Therefore it is no good as a value for the collector's items. I do not fault the publication on this account because it was never intended to cover antique computers. I merely mention it to warn collectors not to expect pricing on their interests.

The Brown Book is available from The Brown Book Inc. P.O. Box 3490, Santa Barbara, CA 93130.

Orion Blue Book

The Orion Blue Book is quite a bit different from the Brown Book but accomplishes the same purpose. It is a hard cover book that is issued once a year and it contains over 200 pages and covers both computers and peripherals. The pricing includes both retail and wholesale prices. The Retail column gives both the list and used price. The Wholesale prices include the price for a mint condition used item and the wholesale price for an average item. The Blue Book also covers both minicomputers, microcomputers and all kinds of peripherals. The Orion Blue Book is the most complete pricing guide I have ever seen for personal computers and peripherals. It is supposed to be based upon reports from dealers all over the U.S. Orion offers dealers a $20 rebate on their next purchase for filing out the pricing survey and sending it in to Orion. It also advises dealers how to profit from the trade in used computers. Again, the Blue Book can not be used for pricing collector's computers since it does not cover the real old makes of equipment.

The Blue Book is available from Orion Research 1315 Main Ave , Suite 230 Durango, CO 81301 for $49.50 per copy.

Rule Of Thumb Pricing

If you do not have one of the pricing books and you have equipment to sell, or you wish to find out if a price offered to you is fair, here is a rule of thumb to go by. A used computer or peripheral in good condition is worth at least 50% of the current selling price. If there is extra equipment included with the item it is worth more, if documentation is missing, or something does not working perfectly it is worth less. Do not buy a computer without documentation including all the hardware and related software manuals for the operating system and major languages. It is very hard to get manuals for some computers so make sure they are part of the deal.

Stolen Merchandise

I hate to bring this up but it is important, there are a lot of stolen items on the market, try not to buy one. The day may come when you need to send your equipment to the manufacturer for repair. At that time a check of serial numbers may indicate that the item was reported stolen. Even if you clear yourself, you will loose your investment. Beware of a bargain that is too good to be true, it may be hot! ●

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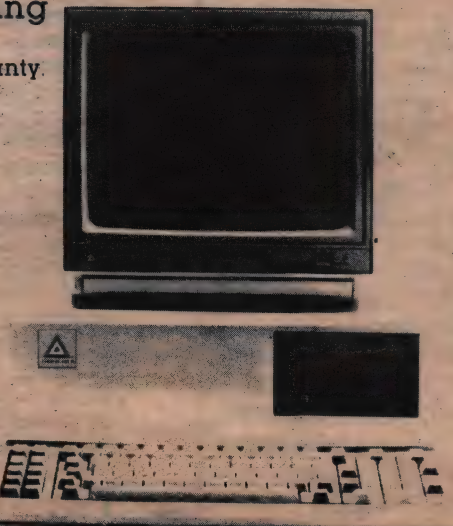

COMPUVISION

Ritchie Hwy. & Jumpers Hole Rd.
Pasadena, MD 21122
(301) 760-5978

Super General Ledger

Continued from page 57

These last two numbers are reserved for departments. If you have, for example, a major account for inventory in three different stores and the account number for inventory is 15000.00, then you could use account 15000.01 as a subaccount for the first store, 15000.02 for the second store, etc. You have to be sure you have allocated space for the department numbers in the Initialize Data File functions before you can enter any. Editing and delete functions are also provided.

Unfortunately, assigning account numbers isn't quite so simple. Once you assign your account a number, a name, an account type (Asset, Liability, Owner's Equity, Income, Expense), you are asked for a group number. The group number tells you which account grouping the particular account will fall under on reports. It's a bit confusing. For example, account 20500.00, Vouchers Payable, is a liability account, so it would be in group eight, Current Liabilities, which is the eighth listing on the Balance Sheet. To compound matters, you are then asked for the placement of the account within that group. This means you had better have all of your accounts and financial statements set up on paper and sitting in front of you when you get to this point because you will need to see their exact positions.

Scheduling, which allows you to combine accounts onto one line on Financial Statements, is a little easier. As you are entering your Chart of Accounts, you simply enter an "S" in response to the "Schedule" prompt for the account which will be first in the group of combined accounts and an "E" for the one at the end. All of these accounts must be consecutive, with the "S" account as the lowest number in the group and the "E" being highest.

Also useful, but complicated, is a feature allowing you to set up ratios, such as that between Assets and Liabilities. These ratios can be printed out on one of several Financial Ratio Reports.

Option 10 on the Main menu, Change System Configuration, is a really nice feature that allows the user to initialize certain features of the system to suit individual tastes. For example, you can tell the program whether you want it to display account or department names when verifying their numbers. Other options include password protection for data files and specifying the retained earnings account.

Adding, posting and editing journal transactions are done through the Regular Journal Transactions option and are as easy as simply entering the date, source of the transaction, account number, reference, amount, department (if used), and a description. If you try to use an account number that doesn't exist, the program tells you so and asks for the number again. If you want to use the same information in your next transaction, you just hit <ENTER> and the field is duplicated in the current transaction. Nice!

But wait, that's not the only time saver Doug has given us. Say, for instance, you have posted a whole bunch of expense transactions and need to input the balancing credits. You probably think you'll have to input all those credits individually. No way! All you have to do is input a transaction to the account to be credited and key in "B" as the amount. SUPER-G/L will automatically compute a balancing amount for you. Pretty impressive.

As impressive as some of the input features are, the beauty of this program is in the report printing functions. There are provisions for almost every type of report that could possibly be wanted, including transactions listings, trial balances, detailed account listings, month or year to date summaries and balance sheets.

All of the bells and whistles are for a price, however, which leads me to my major criticism of the package. You can't look at the reports or listings on the screen, only as a printout. You will use tons of paper with this package. Although the 64-character line on the TRS-80 is a serious obstacle, I would like to see at least a few abbreviated listings on the screen, even if only a few rows at a time. Other packages I have used offer this, and I find it very appealing.

Well, I'm impressed. SUPER-G/L is a very nice accounting package with some very sophisticated features. At $185 though, I feel that the user should get something more than dot-matrix printed documentation. I know it's the contents that count, but it just looks cheap.

Support appears to be excellent and is offered to registered SUPER-G/L owners

Continued on page 109

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Super General Ledger

Continued from page 108

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●

Text Press

Continued from page 58

select the right file for your DOS. This is one of those programs that you need to make more than one copy of as you get started. Once you have the program set up for your use make at least one backup for safe keeping so you don't have to start over from scratch if you blow your working copy.

There are two modes of operation for TP. DIRECT-mode and FULL-mode. The DIRECT-mode allows you to process single text files. In the DIRECT mode you have access to a DISPLAY only feature that lets you LIST a file. Once a file has been compressed it will not be readable under your DOS' LIST command. TP will decompress the file and display it on the screen. This will also work on a file if it has not been compressed. The text is displayed is one screen at a time. You can control this feature allowing a non-stop scan, a screen at a time scan or you can change back and forth. Any ASCII control codes will be displayed as a graphics character. Non ASCII code values (128-255) will be displayed as a larger graphics character. This stops the screen from going to "garbage" during a LIST.

To compress or decompress a file simply use the command TEXT PRESS (source filespec) TO (destination filespec). If the file is compressed TP will decompress it. If it has not been compressed it will be automatically. During this operation the text is not displayed on the screen as it would slow down the operation. You can specify SWAP and the program will pause to allow you to exchange disks before the text is written.

FULL-mode operation produces a menu when you call up TEXT PRESS from DOS. There are 9 selections available that allow full operation of the program. One of the options allows direct access to the DIRECT-mode without leaving the program. Files can be erased from the menu by specifying that option and giving the filespec. Another option gives the option to modify or manage the word list. The rest of the selections deal with operation of the file compressing and decompressing.

Included with the program is a sample run of TEXT PRESS in the FULL-mode of operation. This is a good way to familiarize yourself with the program operation. It does not cover all the facets of TP operation but it will get you along far enough that the rest falls in line without problems.

I used the program on 12 text files and found that I could save about 50 - 60% of the disk space used for storage. This was without changing the word list to suit our particular needs. I believe that with some tailoring of the word list we could save a greater amount of space. Be sure to save your text files in ASCII before trying to process them. The error trapping is excellent. I tried several times to lock up the program and it was most patient with me. The only hang up that I have with TEXT PRESS is that it is Model I/III and most of my work has been converted over to Model 4.

The documentation is excellent. I had no trouble finding my way around the docs or the program. While I was at it I learned some about data storage. The author has taken some time and trouble to be sure that "data dummies" like me don't get lost in the maze of bytes and bits. The program performs as promised and I like it. If you are using Model I or III consider adding TEXT PRESS to your library.

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——	——	——	——	3090-Y	2.39	——	——	800605-Y	2.69	134-7376-Y	2.69
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——	——	——	——	——	——	——	——	——	——	——	——
FD2D-1024-Y	2.89	F2D-S1024-Y	2.89	3104-Y	2.89	——	——	800839-Y	3.14	126-3789-Y	3.14
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Tallymaster
Continued from page 57

sub-command menu which allows a variety of arithmetic options on your data. The MOVE function allows duplication of information so you don't have to re-type it if you want to move things around a bit.

The ZERO command zeroes all numbers so that you can use the same categories and names for a new set of worksheets without having to input them again. The CLEAR command not only zeroes numbers, but clears names as well from selected categories.

The manual takes you through some tutorials on setting up a Quarterly Summary of Expenses and a Sales Summary. The program also includes a report generating function, can print simple bar graphs, and can sort categories by the name or amount. In addition, the worksheets used in the tutorials are provided on the disk along with a sample set of worksheets for home use. These can be modified for specific uses or used as they are.

Tallymaster is one of the few programs I have seen which really straddles the fence between the home and business market. It is simple enough for the home user, yet powerful enough for a small business. It does have some limitations that can be frustrating, though.

The first is that it was not designed to provide any kind of audit trail. You can't even look up a transaction because individual transactions are not kept, only totals for categories and sub-categories. The second is that it does not allow predefined formulas as in a spreadsheet. As an individual, I wouldn't have much use for this function, but it would be handy for business use.

Another consideration has to do with the type of calculations you will be working with. For complex financial analysis, I'd stick with a spreadsheet where you have greater calculating capacity. You can also integrate most spreadsheets with word processors. You'll never be able to do that with the Tallymaster.

The TRS-80 version requires 48k and one disk drive. The IBM PC version requires 128K and one disk drive. The IBM version, which is $50 more than the TRS-80 version, supports the use of the IBM's function keys. Other than that, the operation of the programs are almost identical, so the manual covers both.

Technical support is provided by mail or telephone to registered owners of the package. Please note that the telephone support is at the user's expense as there is no toll-free number (a dying breed among software vendors). A registration card is provided.

For the individual or small businessperson wanting a simple, easy to learn method of keeping track of money without all of the specialized functions found only in a spreadsheet or general ledger package, I would highly recommend Tallymaster. Tesler has done it again.

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North Hollywood, CA 91603
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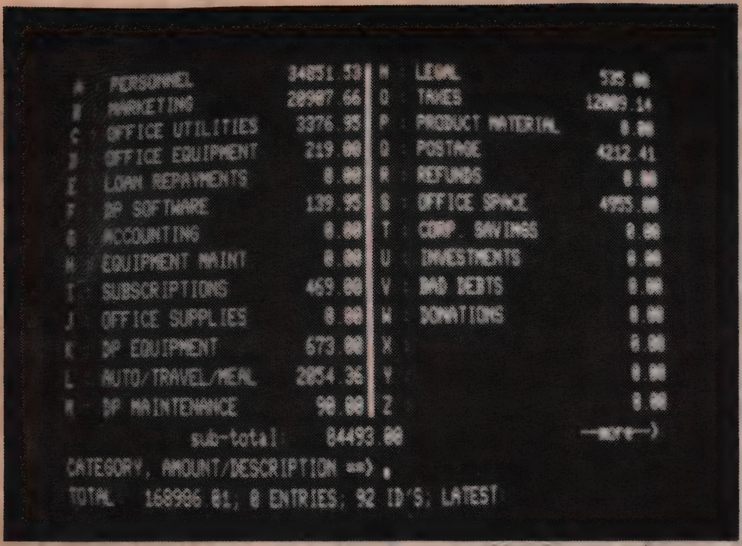
TRS-80 Model I & III — $79.95



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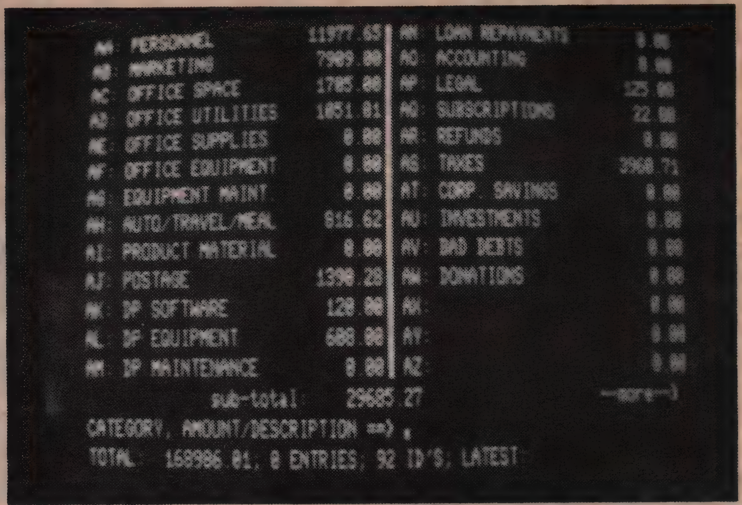

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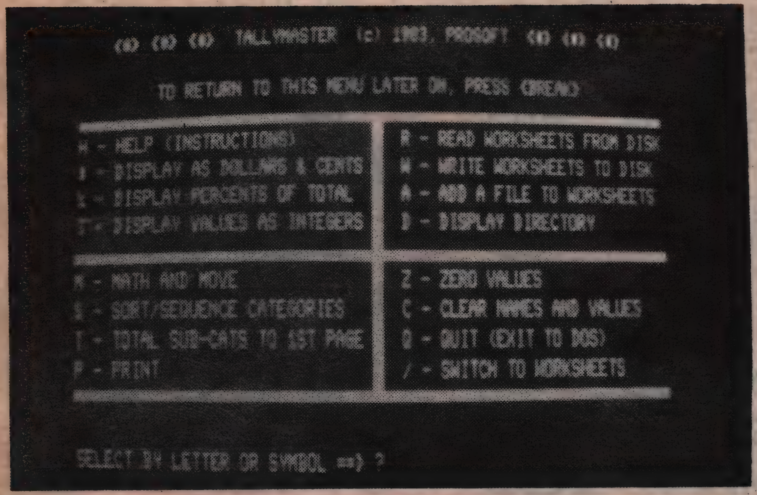

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   (#) (#) (#)  TALLYMASTER  (c) 1983, PROSOFT  (#) (#) (#)

       TO RETURN TO THIS MENU LATER ON, PRESS <BREAK>

 H - HELP (INSTRUCTIONS)          R - READ WORKSHEETS FROM DISK
 $ - DISPLAY AS DOLLARS & CENTS   W - WRITE WORKSHEETS TO DISK
 % - DISPLAY PERCENTS OF TOTAL    A - ADD A FILE TO WORKSHEETS
 I - DISPLAY VALUES AS INTEGERS   D - DISPLAY DIRECTORY

 M - MATH AND MOVE                Z - ZERO VALUES
 S - SORT/SEQUENCE CATEGORIES     C - CLEAR NAMES AND VALUES
 T - TOTAL SUB-CATS TO 1ST PAGE   Q - QUIT (EXIT TO DOS)
 P - PRINT                        / - SWITCH TO WORKSHEETS

SELECT BY LETTER OR SYMBOL ==> ?
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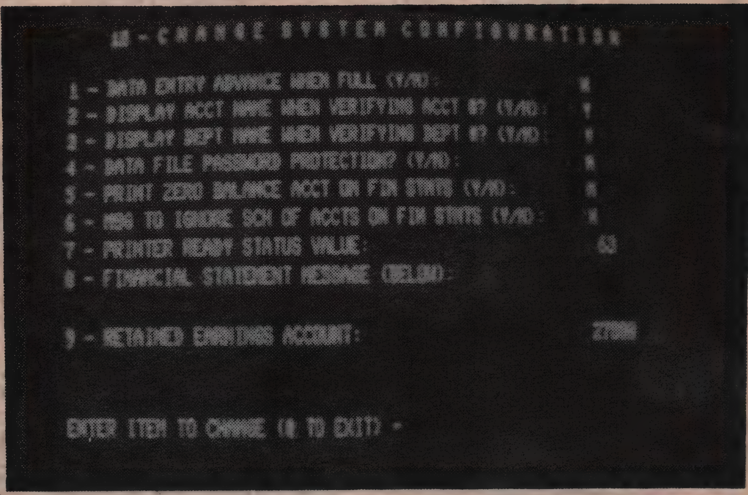

```
   10 - C H A N G E   S Y S T E M   C O N F I G U R A T I O N

1 - DATA ENTRY ADVANCE WHEN FULL (Y/N):                     N
2 - DISPLAY ACCT NAME WHEN VERIFYING ACCT #? (Y/N):         Y
3 - DISPLAY DEPT NAME WHEN VERIFYING DEPT #? (Y/N):         N
4 - DATA FILE PASSWORD PROTECTION? (Y/N):                   N
5 - PRINT ZERO BALANCE ACCT ON FIN STMTS (Y/N):             N
6 - MSG TO IGNORE SCH OF ACCTS ON FIN STMTS (Y/N):          N
7 - PRINTER READY STATUS VALUE:                             63
8 - FINANCIAL STATEMENT MESSAGE (BELOW):

9 - RETAINED EARNINGS ACCOUNT:                              27000

ENTER ITEM TO CHANGE (0 TO EXIT) -
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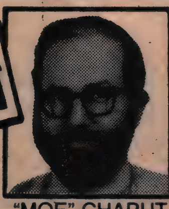
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Aids Plus

Continued from page 58

the right of the decimal if the field is numeric. This procedure is repeated until all the desired fields are defined. Previously defined fields are displayed in the heading as you work. BREAK indicates that you are finished and the system is defined. Later you will have to save your descriptor field to disk. After a system has been defined you can come back using the modify option and change the fields or add fields.

The main menu keeps you informed as to the number of records used, the number of available and the number of the record currently being accessed. Selected sets of records are indicated by the number of records in that set.

Another built-in function is the ability to calculate values for the number of fields. This, too, is easy to handle. Calculations are performed on one record at a time and the results are stored in a specified number field within each record.

There are several optional software packages to go along with AIDS PLUS. The CALENDAR package allows you to display a month's calendar for any month between Jan 1921 and December 2099. This routine is accessed from the calculations option on the main menu. AUTOKEY is another option that will allow you to dedicate single keys to multi keystroke sequences. There is a limited AUTOKEY with AIDS PLUS that allows temporary set up of this function. The optional package will save these sequences to disk for repetitive use whenever you call up AIDS PLUS. This is a time saver for those terms or phrases that you use frequently.

There is more to the program than I am able to describe here. I find that I use AIDS PLUS more than any of the Data Base Managers that I have on the shelf. An added attraction that I stumbled on by accident is that this program will run on the Radio Shack Net Work 3 system. So far it is the only one (DBM) I have found that will run without locking up the system. A quick conversation with the folks at SofTrends indicates that they will license AIDS PLUS for multi machine usage if you contact them to work out the details. From what they said it was reasonable compared to other licenses for the same set up.

Customer support seems to be right up there on SofTrends list of priorities. My questions have been answered quickly and without fuss. Need a Data Base Manager?? Try AIDS PLUS! You will like it.

The program is listed for $99., AUTOKEY for $25, and DATEPACK for $10. For the next couple of months they can be purchased as a package for $89.00.

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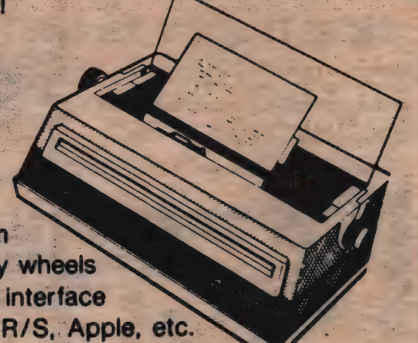

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Remember Thee?

Continued from page 60

maintain data integrity in a dynamic RAM means, there must be some way to maintain this charge.

The circuit that does this recharging is called a "refresh" circuit since it "refreshes" the charge (or lack of charge) on each transistor capacitor in the memory bank.

Some CPUs — the Z80 for example — have a builtiin refresh signal that can be used for this purpose. Other systems use special memory controller chips to perform the refresh function. The refresh process itself consists of reading the information out of the memory, then writing it back at the full logic-0 or logic-1 levels.

The main advantage of dynamic RAM over static RAM memory is that each memory cell in the dynamic version contains only a single transistor and associated tiny capacitance, several of these can be deposited in the same space occupied by a single multi-transistor "static" memory cell allowing a much denser package. Besides being denser, a dynamic memory circuit is slightly more complex than a static circuit because it must also have some form of refresh circuit.

As far as the computer is concerned, there is no difference between using static or dynamic RAM memory. When the dc operating power is turned off, both types of volatile memory cells lose their data.

Read Only Memory (ROM)

ROM memory does not lose its stored data when the dc operating power is removed. However, the payment for this is that you can only *read* from these memories rather than read or write to them, which is why they belong to the non-volatile "Read Only Memory" (ROM) family.

Like a RAM, a ROM also has address, data, and control lines. The block diagram of a typical ROM (in this case a 16K static 8316A) is shown in Figure 2.

The 8316A is a ROM that is activated when a computer system is powered up, since this is the only memory device in the computer system with readily accessible useful data in it when power is first turned

Continued on page 116

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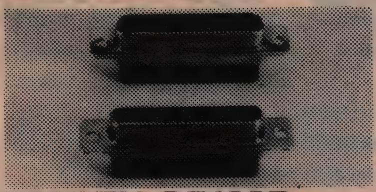
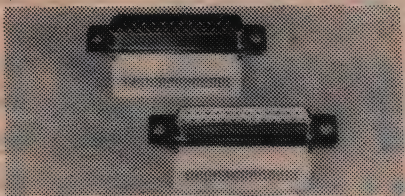
D-SERIES CONNECTORS



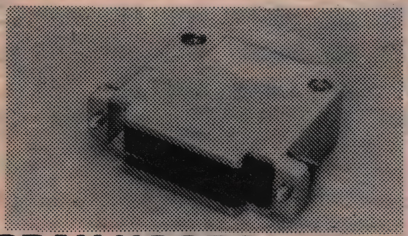
EMPTY CRIMP SHELLS

	PRICE/QTY		
PART #	1-49	50-99	100-UP
C9P	0.86	0.78	0.72
C9S	0.90	0.82	0.75
C15P	0.88	0.80	0.73
C15S	0.92	0.84	0.77
C25P	0.90	0.82	0.75
C25S	0.94	0.85	0.78
C37P	1.04	0.95	0.87
C37S	1.06	0.96	0.88
C50P	1.14	1.04	0.95
C50S	1.20	1.09	1.00



RIBBON CABLE CRIMP ON D CONNECTORS

	PRICE/QTY		
PART #	1-49	50-99	100-UP
IDC-9P	4.00	3.64	3.33
IDC-9S	4.28	3.89	3.57
IDC-15P	4.86	4.42	4.05
IDC-15S	5.24	4.76	4.37
IDC-25P	5.24	4.76	4.37
IDC-25S	5.82	5.29	4.85
IDC-37P	8.22	7.47	6.85
IDC-37S	8.92	8.11	7.43
IDC-50P	19.71	18.40	17.25
IDC-50S	23.87	20.46	19.09

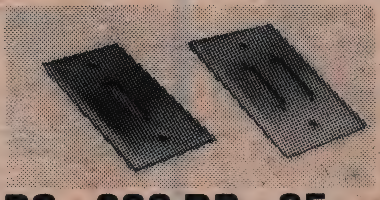


GRAY HOODS

	PRICE/QTY		
PART #	1-49	50-99	100-UP
GH-9	1.02	0.93	0.85
GH-15	1.04	0.95	0.87
GH-25	.95	2.16	1.92
GH-37	1.18	1.07	0.98
GH-50	1.32	1.20	1.10

CONTACTS FOR EMPTY CRIMP SHELLS

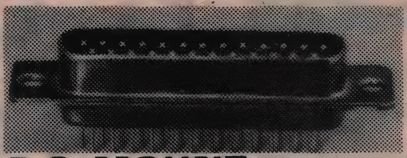
	PRICE/QTY		
PART #	1-99	100-999	1000-UP
CP20P	0.08	0.07	0.06
CP20S	0.10	0.09	0.08



RS—232 DB—25 WALL PLATES

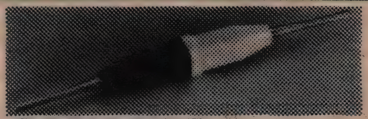
metal wall plates

	PRICE/QTY		
PART #	1-24	25-49	50-UP
WP-1	2.95	2.66	2.36
WP-2	3.45	3.11	2.76



P.C. MOUNT STRAIGHT

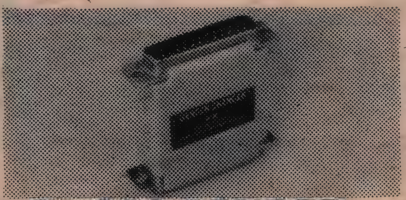
	PRICE/QTY		
PART #	1-49	50-99	100-UP
P9P	1.58	1.44	1.32
P9S	2.60	2.36	2.17
P15P	2.10	1.91	1.75
P15S	3.66	3.33	3.05
P25P	2.90	2.64	2.42
P25S	4.38	3.98	3.65
P37P	4.30	3.91	3.58
P37S	8.18	7.44	6.82
P50P	5.50	5.00	4.58
P50S	10.70	9.73	8.92



CONTACT EXTRACTOR TOOL

extracts contacts from D crimp shells

	PRICE/QTY
PART #	PRICE
EX-1	2.75 EACH



RS—232 GENDER CHANGERS

	PRICE/QTY	
PART #	1-9	10-UP
AGC-M	9.95	7.95
AGC-F	9.95	7.95

P.C. MOUNT RIGHT ANGLE

	PRICE/QTY		
PART #	1-49	50-99	100-UP
R9P	2.54	2.31	2.12
R9S	2.60	2.36	2.17
R15P	2.98	2.71	2.48
R15S	3.10	2.82	2.58
R25P	3.72	3.38	3.10
R25S	3.00	2.73	2.50
R37P	4.70	4.27	3.92
R37S	4.90	4.45	4.08
R50P	9.72	8.84	8.10
R50S	11.00	10.00	9.17

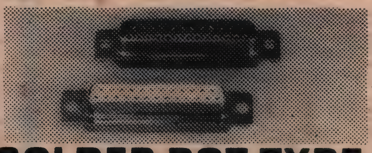
CRIMPING TOOL

for crimping D series contacts

	PRICE/QTY
PART #	PRICE
CT-1645	79.95 EACH

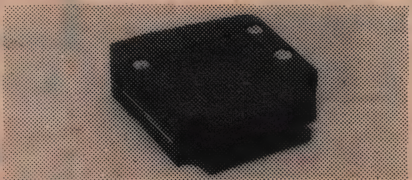
D-SERIES HARDWARE

	PRICE/QTY		
PART #	1-49	50-99	100-UP
MDH-1	0.55	0.45	0.35
FDH-1	0.85	0.75	0.65



SOLDER POT TYPE

	PRICE/QTY		
PART #	1-49	50-99	100-UP
9P	1.44	1.31	1.20
9S	1.94	1.76	1.62
15P	1.96	1.78	1.63
15S	2.60	2.36	2.17
DB-25P	1.85	1.60	1.45
DB-25S	2.10	1.85	1.65
37P	4.00	3.64	3.33
37S	5.20	4.73	4.33
50P	5.08	4.62	4.23
50S	7.80	7.09	6.50



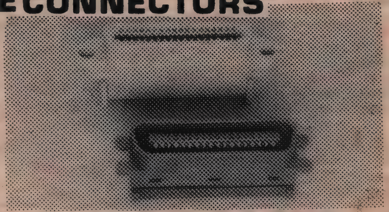
BLACK AMP HOODS

	PRICE/QTY		
PART #	1-49	50-99	100-UP
AH—25	1.30	1.18	1.08

CENTRONICS TYPE CONNECTORS

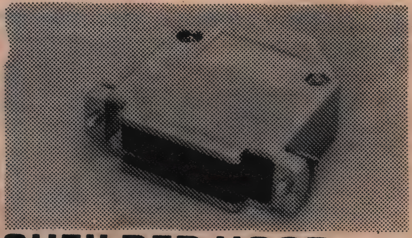
SOLDER POT TYPE

	PRICE/QTY		
PART #	1-49	50-99	100-UP
CEN-36P	4.00	3.64	3.33
CEN-36S	4.20	3.82	3.50
CEN-36SCM	3.50	3.18	2.92



RIBBON CABLE CRIMP ON

	PRICE/QTY		
PART #	1-49	50-99	100-UP
IDC-36P	6.00	5.45	5.00
IDC-36S	7.90	7.18	6.58



SHEILDED HOOD

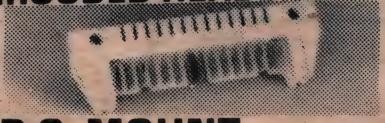
	PRICE/QTY		
PART #	1-49	50-99	100-UP
SH-25	1.35	1.23	1.13

RIBBON CABLE CONNECTORS

IDH SHROUDED HEADERS

P.C. MOUNT RIGHT ANGLE

	PRICE/QTY		
PART #	1-49	50-99	100-UP
IDH-10R	0.80	0.72	0.64
IDH-20R	1.20	1.08	0.96
IDH-26R	1.50	1.35	1.20
IDH-34R	2.00	1.80	1.60
IDH-40R	2.40	2.16	1.92
IDH-50R	2.95	2.66	2.36
IDH-60R	3.86	3.47	3.09

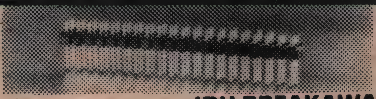


P.C. MOUNT STRAIGHT

	PRICE/QTY		
PART #	1-49	50-99	100-UP
IDH-10	0.80	0.72	0.64
IDH-20	1.15	1.04	0.92
IDH-26	1.50	1.35	1.20
IDH-34	1.95	1.76	1.56
IDH-40	2.30	2.07	1.84
IDH-50	2.85	2.57	2.28
IDH-60	3.45	3.11	2.76

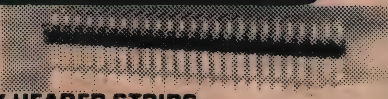
.1 x .1 spacing, gold plated pins

IDH BREAKAWAY HEADER STRIPS



P.C. MOUNT STRAIGHT

	PRICE/QTY		
PART #	1-49	50-99	100-UP
IDH-10B	0.30	0.27	0.25
IDH-14B	0.42	0.38	0.35
IDH-16B	0.48	0.44	0.40
IDH-20B	0.60	0.55	0.50
IDH-26B	0.78	0.71	0.65
IDH-34B	1.02	0.93	0.85
IDH-40B	1.20	1.09	1.00
IDH-50B	1.50	1.36	1.25
IDH-60B	1.80	1.64	1.50
IDH-80B	2.40	2.18	2.00



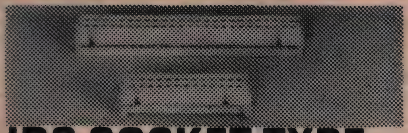
P.C. MOUNT RIGHT ANGLE

	PRICE/QTY		
PART #	1-49	50-99	100-UP
IDH-10BR	0.38	0.35	0.32
IDH-14BR	0.53	0.48	0.44
IDH-16BR	0.61	0.55	0.51
IDH-20BR	0.76	0.69	0.63
IDH-26BR	0.99	0.90	0.82
IDH-34BR	1.29	1.17	1.08
IDH-40BR	1.52	1.38	1.27
IDH-50BR	1.90	1.73	1.58
IDH-60BR	2.28	2.07	1.90
IDH-80BR	3.04	2.76	2.53

dual row .1 x .1 spacing, gold plated pins

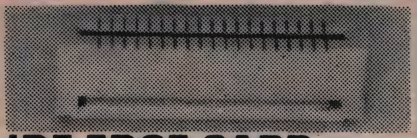
ALTEX ELECTRONICS

RIBBON CABLE CRIMP ON CONNECTORS



IDS SOCKET TYPE

PART #	PRICE/QTY 1-49	50-99	100-UP
IDS-10	1.15	1.04	0.92
IDS-14	1.35	1.22	1.08
IDS-16	1.45	1.31	1.16
IDS-20	1.50	1.35	1.20
IDS-26	2.40	2.16	1.92
IDS-34	2.90	2.61	2.32
IDS-40	3.50	3.15	2.80
IDS-50	4.25	3.83	3.40
IDS-60	5.80	5.22	4.64

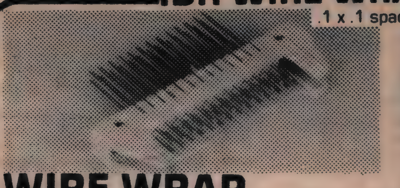


IDE EDGE CARD TYPE

PART #	PRICE/QTY 1-49	50-99	100-UP
IDE-10	1.90	1.71	1.52
IDE-14	2.00	1.80	1.60
IDE-20	2.25	2.03	1.80
IDE-26	2.65	2.39	2.12
IDE-34	2.95	2.66	2.36
IDE-40	3.50	3.15	2.80
IDE-50	4.25	3.83	3.40

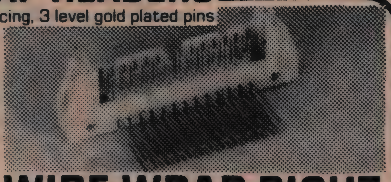
IDH WIRE WRAP HEADERS

.1 x .1 spacing, 3 level gold plated pins



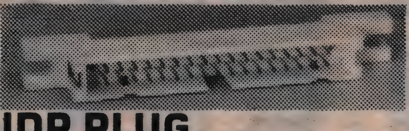
WIRE WRAP STRAIGHT

PART #	PRICE/QTY 1-49	50-99	100-UP
IDH-10W	1.50	1.35	1.20
IDH-20W	2.55	2.30	2.04
IDH-26W	3.20	2.83	2.56
IDH-34W	3.75	3.38	3.00
IDH-40W	4.50	4.05	3.60
IDH-50W	5.50	4.95	4.40



WIRE WRAP RIGHT ANGLE

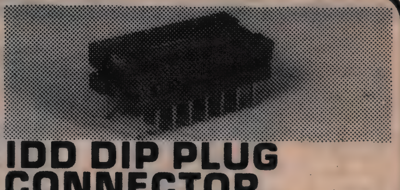
PART #	PRICE/QTY 1-49	50-99	100-UP
IDH-10WR	2.45	2.21	1.96
IDH-20WR	2.60	2.34	2.08
IDH-26WR	3.25	2.93	2.60
IDH-34WR	3.80	3.42	3.04
IDH-40WR	4.65	4.19	3.72
IDH-50WR	5.55	5.00	4.44



IDP PLUG CONNECTOR

mates with IDS type connectors

PART #	PRICE/QTY 1-49	50-99	100-UP
IDP-20P	3.95	3.16	2.53
IDP-34P	4.95	3.96	3.17
IDP-50P	5.95	4.76	3.81

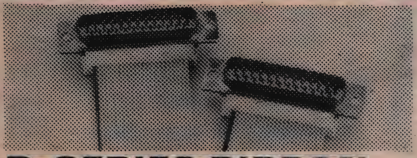


IDD DIP PLUG CONNECTOR

for pluging into IC sockets

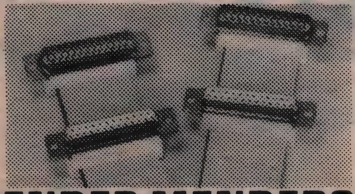
PART #	PRICE/QTY 1-49	50-99	100-UP
IDD-14	1.30	1.17	1.05
IDD-16	1.65	1.49	1.34
IDD-24	2.25	2.03	1.82
IDD-40	3.90	3.51	3.16

RIBBON CABLE ASSEMBLYS



D-SERIES RIBBON CABLES

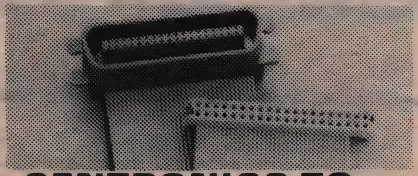
PART #	PRICE
9P-9P	8.00 + .18 per foot
9P-9S	8.28 + .18 per foot
9S-9S	8.56 + .18 per foot
15P-15P	9.72 + .30 per foot
15P-15S	10.10 + .30 per foot
15S-15S	10.48 + .30 per foot
25P-25P	10.50 + .50 per foot
25P-25S	11.10 + .50 per foot
25S-25S	11.30 + .50 per foot
37P-37P	16.44 + .74 per foot
37P-37S	16.95 + .74 per foot
37S-37S	17.80 + .74 per foot



GENDER MENDERS

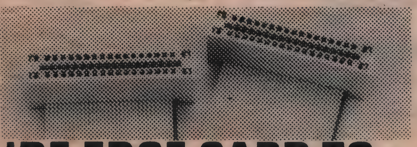
PART # GM—25	PRICE
GM-25	22.50 + .50 per foot

25 pin RS-232 cable with a male and female connector on each end.



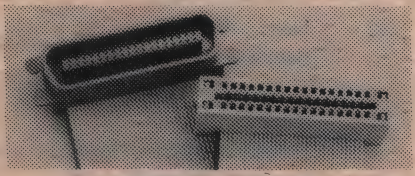
CENTRONICS TO IDS-40 RIBBON CABLES

PART #	PRICE
36P-40S	9.50 + .72 per foot



IDE EDGE CARD TO IDE EDGE CARD RIBBON CABLES

PART #	PRICE
10E-10E	3.80 + .20 per foot
14E-14E	4.00 + .28 per foot
20E-20E	4.50 + .40 per foot
26E-26E	5.30 + .52 per foot
34E-34E	5.90 + .68 per foot
40E-40E	7.00 + .80 per foot
50E-50E	8.50 + 1.00 per foot



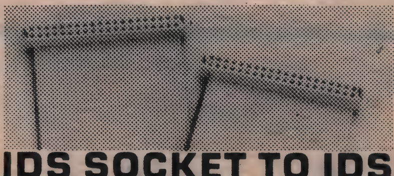
CENTRONICS TO IDE-34 RIBBON CABLES

printer cable for TRS-80 computers

PART #	PRICE
36P-34E	10.25 + .68 per foot

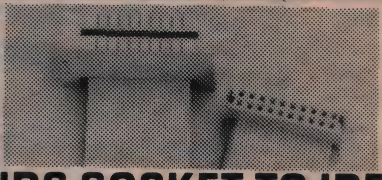
CENTRONICS 36 PIN RIBBON CABLES

PART #	PRICE
36P-36P	12.00 + .72 per foot
36P-36S	13.45 + .72 per foot
36S-36S	15.90 + .72 per foot



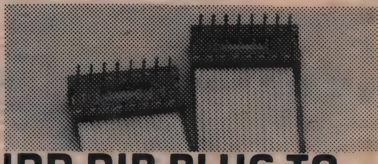
IDS SOCKET TO IDS SOCKET RIBBON CABLES

PART #	PRICE
10S-10S	2.30 + .20 per foot
14S-14S	2.70 + .28 per foot
16S-16S	2.90 + .32 per foot
20S-20S	3.00 + .40 per foot
26S-26S	4.80 + .52 per foot
34S-34S	5.80 + .68 per foot
40S-40S	7.00 + .80 per foot
50S-50S	8.50 + 1.00 per foot
60S-60S	11.60 + 1.20 per foot



IDS SOCKET TO IDE EDGE CARD RIBBON CABLES

PART #	PRICE
10S-10E	3.05 + .20 per foot
14S-14E	3.35 + .28 per foot
20S-20E	3.75 + .40 per foot
26S-26E	5.05 + .52 per foot
34S-34E	5.85 + .68 per foot
40S-40E	7.00 + .80 per foot
50S-50E	8.50 + 1.00 per foot



IDD DIP PLUG TO IDD DIP PLUG RIBBON CABLES

PART #	PRICE
14D-14D	2.60 + .28 per foot
16D-16D	3.30 + .32 per foot
24D-24D	4.40 + .48 per foot
40D-40D	7.80 + .80 per foot

PARALLEL PRINTER CABLES

IBM PC TO PARALLEL PRINTER

PART #	PRICE	10-UP
PPC-301-5	19.95	16.95
PPC-301-10	24.95	19.95

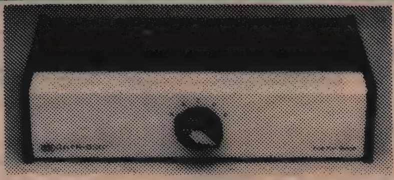
SERIAL/PARALLEL DATA TRANSFER SWITCHES

PART #	DESCRIPTION	PRICE
AB-25	RS-232 SWITCHBOX	88.00

switches all 25 lines; two positions for interfacing; two printers to one computer or one printer to two computers

PART #	DESCRIPTION	PRICE
AB-36	PARALLEL SWITCHBOX	138.00

switches all 36 lines two positions for interfacing two computers to one printer or two printers to one computer.



PART #	DESCRIPTION	PRICE
AB-5	RS-232 5 PORT SWITCHBOX	149.95

switches 12 lines 5 positions for connecting any one of five terminals to one serial modem or five parallel printers to one computer or vice versa.

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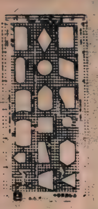

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Remember Thee?
Continued from page 113

on. The data permanently stored in the 8316A ROM is used to "power up" the computer, perform any test functions, display any on-screen messages, and turn on the disk (if used).

ROMs, PROMs, EPROMs & EAROMs

Although they all work in essentially the same way, there are three basic types of non-volatile semiconductor memory — the ROM, the PROM, the EPROM, and the EAROM. Each uses a slightly different approach to data storage.

There are three major semiconductor technologies involved with ROMs. These are "bipolar" which allows the fastest access time; "MOS" which is usually used for erasable PROMs and are somewhat slower than bipolars, but require less operating power; and MNOS or metal-nitride MOS. This last technique should not be confused with NMOS (n-channel MOS).

ROMS (Read Only Memory)

ROMs are usually mask-programmable "fuse-link" devices permanently programmed by the manufacturer and the data cannot be altered.

PROMS (Programmable ROMs)

A PROM is a read only memory that can be altered by the user using a special piece of equipment (and associated software) called a PROM "burner".

EPROMs (Erasable, Programmable ROMs)

An EPROM is a ROM that can be erased by shining an intense ultraviolet light through a small quartz window on the upper surface of the chip. Once this is done, the EPROM can be programmed using an EPROM programmer, usually in conjunction with a computer. When desired, the EPROM can be erased and reprogrammed again. Once programmed, a typical EPROM will retain its internal data for about 10 years.

EAROM (Electrically Alterable ROMs)

The EAROM is an Elec-

Continued on page 141

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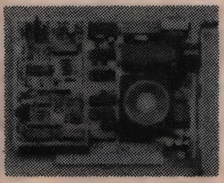
DataComm 12BH



DataComm 12B

FEATURE:	DataComm 12B	DataComm 12BH	HAYES 1200B
300/1200 auto dial, auto answer	yes	yes	yes
Compatible with 'AT' command set	yes	yes	yes
Intelligent microprocessor	yes	yes	yes
Tone and pulse dialing	yes	yes	yes
Analog loop back self test	yes	yes	yes
Speaker and volume control	yes	yes	yes
Switch selectable control	yes	yes	yes
Call progress monitoring	yes	yes	
Auto redial on busy	yes	yes	
Adaptive dialing	yes	yes	
Self test at power up	yes	yes	
On board volume control	yes	yes	
Optional serial port	yes		
Half card size		yes	
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7	Serial Card single port	$ 45		
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9	Printer Card	$ 34		
10	256K RAM Card (no RAM)	$ 50		
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12	256K RAM Card	$ 199		
13	Multi-function Card	$ 220		
14	Monochrome Card	$ 105		
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103.22  PLIFE    .PAS      9K  D3 A2
103.23  TWINKLE .PAS       2K  F0 DD
103.24  WUMPUS   .PAS      9K  8B A6
103.25  LIFE     .PAS      8K  B5 FA
103.26  CRIBBAGE.PAS      19K  DB DD
103.27  CRIBBAGE.PS3       2K  66 1F
103.28  CRIBBAGE.PS2       5K  6E F7
103.29  PASGAME .DOC       8K  80 3E

The Third Dimension 3D Graphics
Generator system
103.30  CUBE     .FIG      1K  DC 36
103.31  HOUSE    .FIG      1K  8C 20
103.32  TUBE     .FIG      3K  CE BF
103.33  PYRAMI   .FIG      1K  FB 03
103.34  BOXINB   .FIG      1K  1D 1D
103.35  TABLE    .FIG      1K  C0 34
103.36  SPIRAL   .FIG      4K  84 E3
103.37  SHAPE1   .FIG      1K  E9 A4
103.38  FUNC     .HLP      2K  4E CE
103.39  MAIN     .HLP      2K  2C 7E
103.40  3-D      .DOC      4K  DB 9B
103.41  3-D      .EXE     53K  E7 FB
```

```
PC-Blue volume 102
Games for IBM-PC

3D Demon Chase
Catch The Bouncing Baby
Castle Adventure
Janitor Joe

contents of PC-Blue volume 102
         -CATALOG.102
checksum program
         CRCK4    .COM
3 dimensional Demon Chase
102.01  3-DEMON .DOC      11K  0A DA
102.02  3-DEMON .EXE      59K  AB 92

Catch The Bouncing Baby
102.03  BABY     .EXE     37K  FE F4

Castle Adventure
102.04  CASTLE  .DOC       3K  98 F0
102.05  CASTLE  .EXE      72K  3E FC
102.06  CASTLE  .RAN      48K  97 5C

Jumping Janitor Joe
102.07  JUMPJOE2.EXE      62K  46 F2
102.08  JUMPJOE2.SOL      15K  70 FF
```

```
contents of SIG/M Volume 223
         -CATALOG.223
description
index    name              size   crc

Sets date in DBASEII - NEC APC
223.01  DBIIDATE.PRG     2K   60 3D

Extended SUBMIT
223.02  DO       .LBR    26K   B0 54

Data base program
223.03  FREEBASE.LBR    19K   88 9E

Creates RAM disk
223.04  MEM      .LBR     4K   26 41

Sets colors on NEC APC
223.05  PDABACUS.CMD     2K   39 E8

RAM disk for NEC APC
223.06  PDRAMDSK.AQ6    10K   1B 9B
223.07  PDRAMDSK.CMD     5K   19 1F

RESOURCE disassembler - CP-M 86
223.08  RES86    .LBR   83K   F8 F6

Segments files for copying
223.09  SPLITTER.LBR    12K   0E 3C

Prints labels - CP-M 86
223.10  TLABEL86.LBR    14K   E2 5D

223.11  WYSEFK21.AQM     6K   7E F8

SIG/M    Volume 222
Updates to Handy Utilities
8080 disassembler, revised AreaCode
module, directory utility, revised
library  utility LU and a new  view
of LU


contents of SIG/M Volume 222
         -CATALOG.222
description
index    name              size   crc

New areacodes, including 718
222.01  AREACD13.LBR    22K   B5 EF

8080 disassembler
222.02  DASM8080.LBR    90K   EA 47

Improved multi column printing
222.03  DBL003   .LBR   11K   1B 0E

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Updated library utility LU
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A new approach to LU
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SIG/M    Volume 221
dBASEII(tm) Inventory System,
Decoder,
Patch and MP/M Implementation
notes

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         -CATALOG.221

description
index    name              size   crc

MP/M setup programs for dBASE II
221.01  DBASEMPM.LBR     4K   4C AF

Decodes some run-time programs
221.02  DBSOURCE.LBR    60K   30 B1

Inventory system
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SIG/M    Volume 218-220
MEX - an Improved Modem for CP/M
by Ron Fowler  3 Volumes

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Otrona Attache Overlay
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Obsorne 1 wo a COMM-PAC modem
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Osborne Executive
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PCM Micromate
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Mega SC
219.14  MXO-MG10.AQM    11K   CC 6B

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219.15  MXO-MR10.AQM     8K   37 CD

NEC PC-8801
219.16  MXO-NE88.AQM    14K   C9 C2

North Star Horizon
219.17  MXO-NS11.AQM    15K   9F 3E

MEX main program (uninstalled)
218.01  MEX112   .OBJ   24K   7B F0

MEX Copyright notice
218.02  COPYRITE.        2K   F3 09

On-line users manual
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Submit  file to construct installed
MEX modem implementations
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Popcom
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218.16  MXO-AL10.AQM     8K   24 9D
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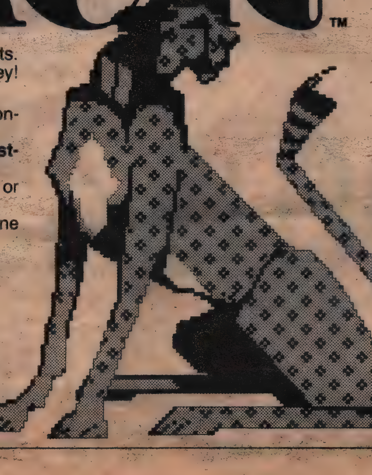

Triple Threat

Continued from page 56

the default file "ruler.def."

For example, revise a copy of the ruler for elite type (12cpi), putting the right margin character "R" at space 76. Name this file "ruler.96." When you open a working file, give it the extension 96. The program will load with the elite ruler, instead of the default ruler designed for Pica (10cpi).

Formatting And Printing

General page formatting is done by means of "dot commands," that is symbols preceded by a period, as in WordStar or in IBM's Script program. There are about a dozen dot commands that make possible all variations of page heading/footing, numbering, margins, chaining separate files, allowing insertions from the keyboard while printing, etc. These can be imbedded in the text, or entered in DOS at the time of printing. For example, the default left margin is two characters. This can be changed in two different ways.

(1) By once again putting your document on the screen and adding a dot command:

.J:7

This will change the left margin to seven spaces. You can make that number whatever is desired. To double-space your text, type in:

.m:2

After you have entered all the desired dot commands, save the document to disk again - keys F1 and F3. To number pages use either footer or header command, adding "$$$" at the position the number should appear on the line. Use .n:1 to indicate numbering should start with "1" (or other number indicated).

Now you are ready to print with correct margins and spacing. At the DOS prompt, enter: A>pr b;file.ext <and hit return> File will now print with all the indicated formatted features.

(2) Or you can add the commands when starting the print routine. Type at the prompt only A>pr <CR>. A strange secondary prompt will appear like this:

U:

Now type the first dot command:

U:.j:7 <CR>

Now another U: appears. Type in the second dot command, and so on. When all the commands are entered, use .t: and name of file to commence printing. You can see all the available dot commands by accessing the last page of the help files (F1).

Selecting Fonts

PC-Write permits 15 printing fonts, and combinations. These codes are imbedded in the text by hitting certain characters and the Alternate key. For example, text can be marked for boldface with Alt-B; for underlining with Alt-U; for superscript with Alt-H, and so on. If your printer permits, doublewide, elite, compressed, double underline, proportional spacing, and more, are available and can be switched back and forth in the same document, indeed, in the same word!

We have illustrated the great power and felicities of PC-Write. All this information is supplied on the 8 screens of help that comes on the system disk. However, the full documentation is supplied in an elegant volume when the user remits the modest royalty fee, $75. Does one gain in other ways by registering as a user? Unlimited technical support on the telephone, given with patience and humor. And, not neglible in this pioneering technology, automatic disk upgrades and technical notes in the mail.

Forthcoming soon is an important upgrade. Under the present version, file sizes are limited to about 64K. Programmer Wallace, who does his magic in Pascal, has not been willing to sacrifice speed for file size. Now he reports that the problem is solved and a new version of PC-Write is about to be distributed. It will permit files to load directly to memory, limiting file size only by the extent of RAM. And, the program will read and write even faster than the old version!

Slim, Trim, Fast & Easy

PC-File III is all of these things. In addition, it is freeware; and to register as a user, the cost is $49, very moderate by any standard. A real bargain. The programmer in this instance is Jim Button. His address is PO Box 5786, Bellevue, Washington, 98006.

This is a general purpose database manager. With it you can do virtually all of the things made possible by programs that sell for several hundreds of dollars. You can easily create and maintain all kinds of data collections, such as mailing lists, price lists, inventories, personnel files, customer lists, accounts receivable/payable, etc. You can access the data for purposes such as billing, writing reports, mail merging of form letters, finding telephone numbers, names and addresses.

With full-screen editing, smart key definition macros, simple global update/delete, a nice browse mode, automatic entry of dates and times, full indexing of fields and keywords within fields, math calculations built in, label printing, report writing, and tight and ample menus (and not too many) to help the user step-by-step along his way.

In addition, the program allows export of data into other programs, such as VisiCalc, Multiplan, 1-2-3, Symphony, Framework, Word, and MailMerge; and import of data from these into the PC-File format. A very recent feature maintains the security of the data from prying eyes, by permitting the "encrypting" of files with a security code known only to those authorized.

The program will surprise anyone who has struggled to learn DBaseII, or even PFS-File; it is too easy to learn to be so powerful! Button has indeed wrought a small miracle. Like PC-Write, the routines seem to speed up the old PC and make it behave like an AT.

Impressive is the ease and

Continued on page 122

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An Introduction To Tree Structured Directories Under PC/MS-DOS 2.xx

by Bill Chin

One of the most powerful features of PC\MS-DOS 2.xx is its ability to use multiple directories in a tree-like-structure. When using a 5 Mb or larger hard disk one is limited to about 318 files in its main directory, but it can handle groups of files in which one calls sub-directories. The directories are organized in a hierarchical type tree-like structure. The easiest way to view directories is the idea of users organization of an office file cabinet or the sorting of the mail within a post office from mailbox to mail sack to post office to street to apartment.

The concept of a tree-structured directory is similar to that of a family tree. There is one "root" directory and all other directories are like "children," able to trace their lineage back to their "first ancestor" (the root directory). You can have as many "generations" of directories as you like, but you can only move about in this "family" tree structure in a direct path that goes from "parent to child" or "child to parent". A path may go from "root" to "parent" to "child", but it cannot go directly to "child" without passing through "parent". Each directory can contain program and data files as well as its descendant sub-directories.

Here is an example of a typical tree-like directory structure.

Example Tree Structure

```
root directory                               ±
                             -----------------------------
sub-directories         /          ½           ½               ±
                  PROGRAMS     BINARY    LANGUAGES          USERS
                 ----------    ------    ---------       -----------
            /      ½      ±                               /      ½       ±
         WRITER  CALC  FGRAPHS                           BOB    SUE     JOE
         ------  ----  -------                           ---    ---     ---
data        ½                                                   ½
files    PRINTING                                              TEXT
         --------                                              ----
```

Before loading numerous files on a hard disk it may be useful to plan a directory structure. Note the sub-directory named BIN in the example above. This type of directory is sometimes used to hold MS-DOS utilities so that the root directory contains not only its named sub-directories but files within the subdirectory levels. It is to allow the file directory area not to get cluttered up with the many DOS type files within the individual levels but some user organization if one chooses.

MS-DOS provides commands to use this tree-like directory structure.

They are:

MKDIR or MD - Make a new directory

CHDIR or CD - Change the default (present) directory

RMDIR or RD - Remove a directory

PATH - Layout a pathway to search through sub-directories for a file if it is not on the cur-

Continued to page 124

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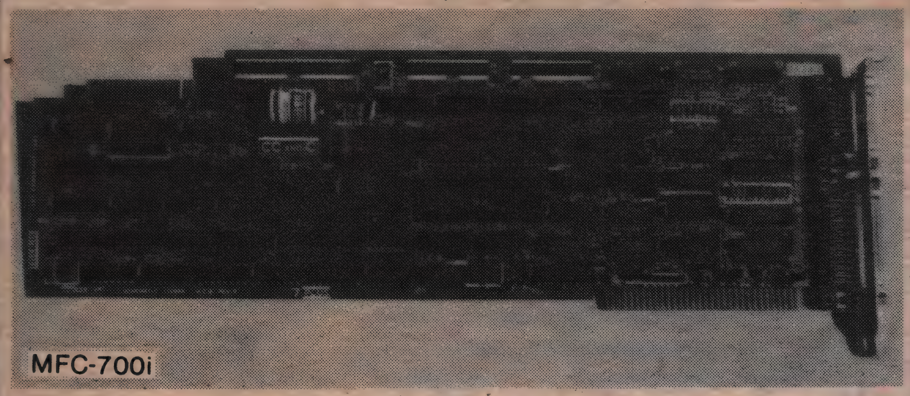
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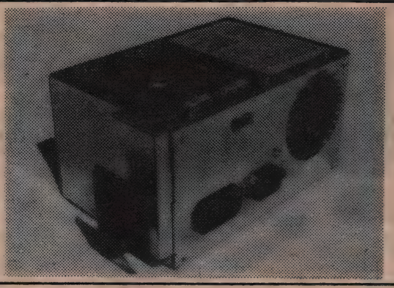
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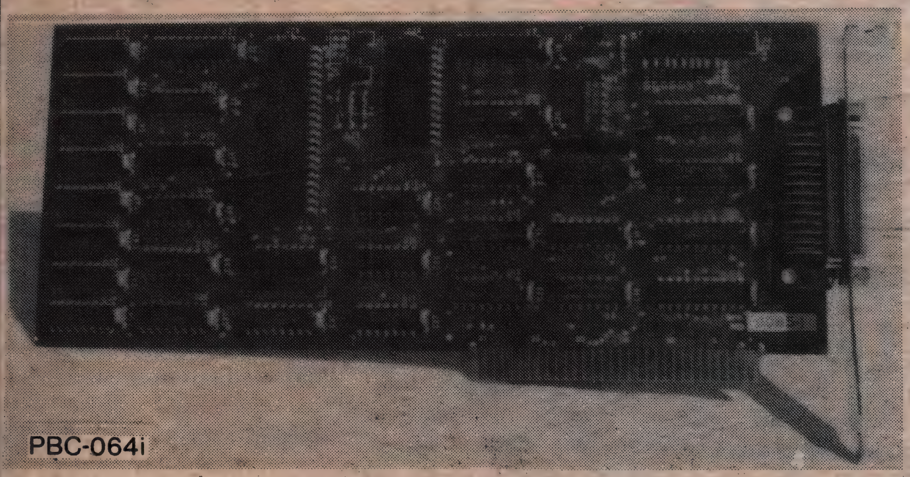
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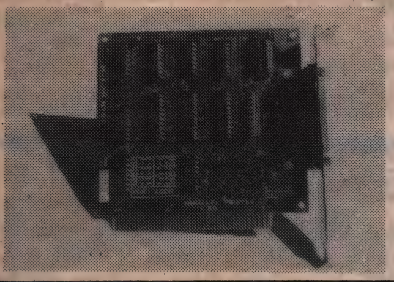
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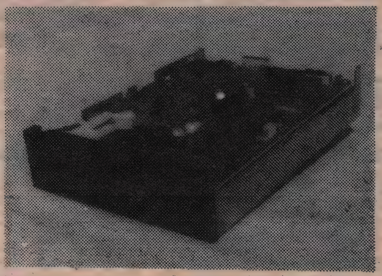
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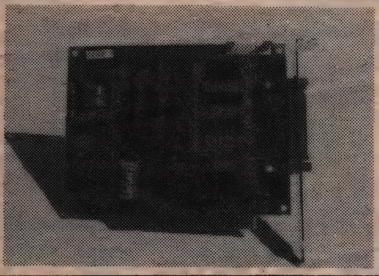
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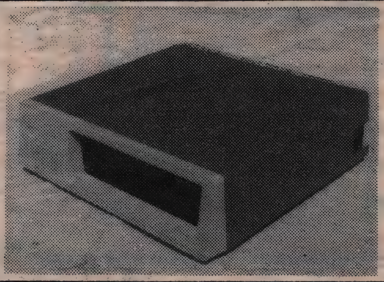
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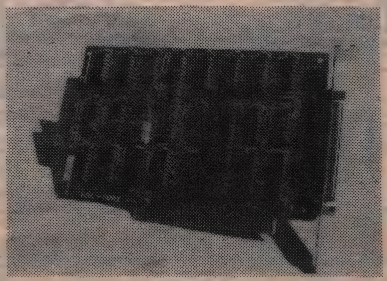
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Triple Threat

Continued from page 119

speed of access into any record in the database, with advanced techniques allowing comparison searches and artificial intelligence sorts and searches. For example, one can readily display all employees over a certain age, all customers with last names "sounding like" Swoboda, or all items triangulated by combinations of dozens of different data fields.

In Button's words, "the new database can be in a different format, and can be a subset of the database from which it was cloned." Yet, with all its power, Jim has refused to get into any virtuoso routines that would create difficulties for the user. Too often, programmers make difficulties just to bedazzle and dismay. There is a deadly tendency of programmers to show off to each other, without thought of the poor stiffs who have to learn and use the product.

But not in this case. Button's product is a slim, mean, and effective piece of software that is gaining converts every day. Like PC-Write, the file system will run beautifully with any MS/DOS or PC compatible, requires only 128K RAM and one disk drive. Of course, it will handle more data more conveniently with two drives and larger memory.

One starts PC-File by typing the name at the DOS prompt. The names of any data files will be displayed with the message "These files are already defined." The user enters a filename, either one of those extant or a new one. The program offers a prompt: "KEY FIELD NAME:" which identifies the database to be defined.

The user is prompted to enter a list of field tags and lengths. It's all so straightforward and simple. If the field contains numeric characters, such as age or price, one puts a # at the end. One is prompted in this way until the entire file card is defined. Record definition ends by hitting the enter key. One can enter up to 42 fields of lengths up to 65.

Immediately the master menu appears:

F1	**ADD a record**
F2	**MODify a record**
F3	**DELete a record**
F4	**DISplay a record**
F5	**FINd a record**
F6	**LISt or clone**
F7	**SORt the index**
F8	**EXPort or other utilities**
F9	**alter field NAMe or mask**
GLO	**GLObal update or delete**
KEY	**set up the smart KEYs**
END	**END or change database**

Such a nice integration of all functions! And all the routines follow with logic and clarity from the master menu. Neophytes have difficulty conceptualizing most databases; my experience in teaching PC-File to non-technical college students convinces me that Button has a special gift for designing programs that flow so naturally and smoothly step-by-step as to make the user feel smarter than usual, and to give him a zest and confidence that is a self-fulfilling prophesy.

We have led the reader through only to the threshold of the program, in order mainly to illustrate PC-File's simple and swift architecture. This is merely by way of introduction, not only to Button's handiwork, but to the world of freeware in general.

And this world is by no means a transitory phenomenon. Some observers have remarked that software-creation has irreversibly moved away from the small innovator in his basement. Software design, they say, has become too large and complicated for such lonely pioneers. Only large and powerful corporations can bankroll the teams necessary for state-of-the-art programming. Memory has gotten too cheap. Marketable software must be huge and full of embellishments, with every variety of action graphics, sounds and music, and no nit nor tipple or gratuitous and dazzling sidebar function neglected.

It is true that programming has been transformed. The inspired loonies and artists who created the industry are in the process of being replaced by partitioned boiler-rooms filled with people with 3-piece polyester minds. Steve Wozniak flees from the emerging Mac-regimentation, and hordes of faceless new Ph.D.s march into their cubicles in unconquerable lockstep.

But, as has been proven in every field of hi-tech, the place of the independent innovator is more valid than ever. They are certainly an endangered species, because they do not fit in! For some of them, like Wallace or Button, the world of freeware is an hospitable

Continued on page 124

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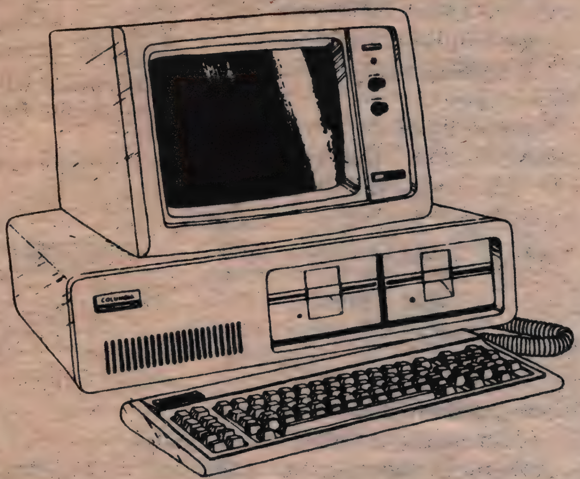

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These programs include: • MS-DOS 2.11 • MS-DOS tutorial • BasicA 2.0 (This runs all the IBM GW BASIC programs we tried) • Perfect Writer • Perfect Writer tutorial • Perfect Speller (50,000 words) • Perfect Calc spreadsheet • Perfect Calc tutorial • Perfect Filer DBMS • Fast Graphs (color) • Perfect Link (modem program) • Home Accountant Plus • TIM IV relational $400 data base • Columbia MPC tutorial • Space Commanders • Hardware diagnostics •

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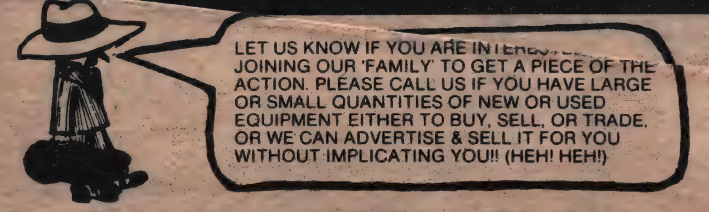
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Tree Structural Directories

Continued from page 120

rent directory
TREE - Display a listing of sub-directories

When a hard drive system first boots up, regardless of the directory structure, it comes up in the boot area (which is in the root directory) which then transfers control to the CONFIG.SYS command batch file then a users SHELL area (usually COMMAND.COM) then the AUTOEXEC.BAT file if it exists.

To build a sub-directory (LANGUAGES, for example), type the command

```
MKDIR LANGUAGES.
```

You can move or COPY files from the root directory into the subdirectory by typing.

```
COPY <filename>
  LANGUAGES
```

and transport within or between levels by using the named directory references as

```
\PROGRAMS\WRITER\
<files....>
```

to

```
\PROGRAMS
```

or to

\USERS2BOBS directory area.

To move the default file access reference from the root directory to a sub-directory as LANGUAGES one types CHDIR LANGUAGES. A DIR command from within a sub-directory will display the files in that subdirectory.

From the root directory,

```
DIR\LANGUAGES
```

will display the files currently in the subdirectory named LANGAUGES.

The symbol "\" is known as the "path separator", and is used to separate the directories in a "path" from any file specified at the end of a path. The symbol "\" can also be used as the first item in a path to tell your system to start at the beginning of the root directory and move down a path, instead of having to type all the directory names for a path that goes up the tree and back down again. As a general rule, the backslash symbol (can be redefined) must be used whenever you are in a subdirectory and want to go to any other directory for a file, or when you are specifying a pathname.

The MS-DOS 2.xx PATH command allows you to specify a "path" to be used in a search for a file.

For example, if you type
PATH\LANGUAGE
MS-DOS will first search the root directory, then the LANGUAGE directory for a file that it could not find in your present working directory. This predefined "path" will stay resident until you change it. You can see the defined "path" any time by typing PATH and pressing the Enter\Return key. If you are logged onto the A: drive and want to call BASIC from the LANGUAGES subdirectory on drive C:;, the drive name must be included in the PATH command:

```
PATH C:\LANGUAGES
```

Having defined the path (while still logged onto drive C:), you can switch to A: and call up BASIC by typing:

```
C:BASICA
```

There is very useful when you have a copy protected BASIC program on a floppy diskette, especially when there is not enough room on the floppy for the system files, the COMMAND.COM file and BASICA. After specifying a path while logged onto C:, switching to A:, then calling BASIC, the BASIC prompt (OK) will be displayed on the screen. Load and run the program you need from Drive A:. The SUE sub-directory might look like this:

Volume in drive C has label HARDDISK Directory of C:\USERS\SUE

```
TEXT     <DIR>        11-23-83   11:23a
FILE1    EXE 16435    9-10-83     4:31p

4  File(s)   6457039 bytes free
```

This is one file (FILE1.EXE) and one sub-directory (TEXT) in the SUE sub-directory. The "." entry in this sub-directory stands for the working directory (in this case, the SUE sub-directory), and the ".." entry stands for the "parent" directory (in this case, the USERS sub-directory). Both "." and ".." are present in all sub-directories. The entry ".." can be used as a shortcut in a "path" to move to the parent directory. Thus, to change to the USERS directory from the SUE directory, type "CHDIR..".

To get a directory of all the directories on the disk, type
<unit>:DIR <\path
from the root directory. All the files which do not have extensions will be displayed, and if they are directories, MS-DOS 2.xx reports it with a <DIR> message beside the directory name.

It is important to avoid con-

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Triple Threat

Continued from page 122

refuge. There they will endure and even thrive. Real value and innovation, from any source, can split the mountains of corporate power in the conglomerate marketplace. In the interest of this worthy cause, as well as to discover better and cheaper software, we need to look at freeware.

It is not dying away. Indeed, new and better freeware is emerging everyday. It doesn't buy advertising lineage in the glossy computer press, so it is not reviewed there. There is a natural affinity between *Computer Shopper* and freeware!

In Part III, we will look at PC-Talk, and also briefly review a dozen or so other pieces of freeware. ●

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Disks	2
Index	1

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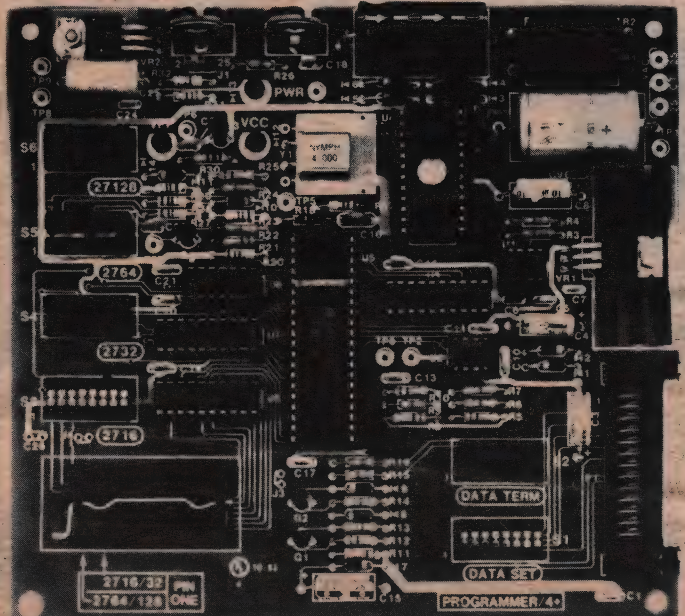

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Tree Structure
Continued from page 124

fusing the path from root to sub-directory to file with the PATH command. The path between directories can be thought of as a pathway, while the PATH command is used primarily as a "roadmap" to let the file controller of the operating system search for its required files and which alternate pathways to follow when looking for files.

To help find your way around a complex directory structure, you will find the MS-DOS 2.0 TREE command useful. It lists all the directories on the disk and their sub-directories. The HUNT command will show you the sub-directory location of a file.

The "Getting around" in MS-DOS's tree structured directory may seem complicated at first. But as you use directories, you will grow accustomed to them, and you will appreciate the ability to organize and structure your files. The IBM people supply an audio tutor cassette tape which will guide you through a few practice exercises in using the structured directories, and in a diskette with your IBM-PC called "Exploring the IBM Personal Computer" also introduces the file storage concepts. The PC-DOS or MS-DOS Reference Manual contains a detailed explanation of the directory structure in chapter 4 and a description of the commands that relate to it in chapter 5. ●

Heath/Zenith

I - How Well Do You Know MS-DOS?

by Harold W. Bauman

I am sure that most of **Computer Shopper**'s readers know how to use most of the MS-DOS Operating Systems with their Heath/Zenith computers. However, I am sure that I can help most readers to get more from their MS-DOS Version 2 system than they are now using! Read this article to find out!

If the readers are using the Heath/Zenith MS-DOS program manual from H/Z, I am sure that they know and agree that H/Z supplies some of the best documentation in the industry. But, how many of the readers have looked, read, and used the H/Z MS-DOS Version 2 Programmmer's Package - Catalog Number CB-5063-16? Did I hear anyone say I do NOT expect to write programs so why should I?

This Programmer's Package is a MUST if writing programs for use with the H/Z-100 type computers. It is MORE than a programmer's tool. It helps all MS-DOS users with additional utilities and information that just can not be found anyplace else. It will help the user to understand and use utilities that came with the MS-DOS Operating System. I should also mention that most of this package would be of help to the IBM-PC and IBM-PC Clone users as well.

I will need to write a series of articles to cover all of the subjects. In order to avoid articles that would lose some readers and bore other readers, I will sacrifice some continuity. I will include some hints and expanded uses for popular utilities, describe some new utilities, and include some theory in each article. Hopefully every reader will find at least some material of interest in each of the articles. I believe that we have a wide range of readers with differing amounts of skills to work with. One thing, these will NOT be articles on how to write programs!.

Some subjects that I will cover include the following:

```
1--Replacement of EDLIN (my pet peeve) with BSE--
   Basic Screen Editor.
2--Macroassembler.
3--Cross Reference Utility.
4--Three versions of source BIOS.
5--FILTERS.
6--Memory disk linked into operating system.
6--BATCH processing commands.
7--CONFIG.SYS usage.
8--ANSI.SYS usage.
9--Keyboard Reassignment.
10-Directory Paths.
```

The above list contains just a few of the subjects, but I hope that one or more will develop the reader's interest.

For a starter, I am going to discuss the MS-DOS PROMPT command that is Resident in the operating system. PROMPT has MORE power than most think! How many readers have ever used it? Have

Continued on page 136

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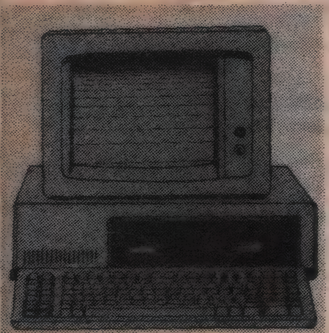

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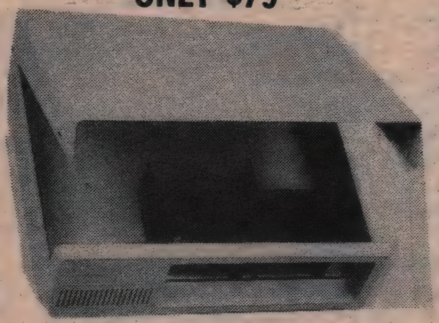

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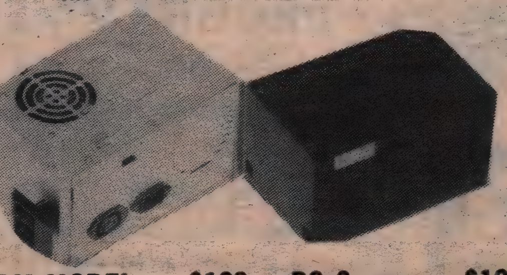

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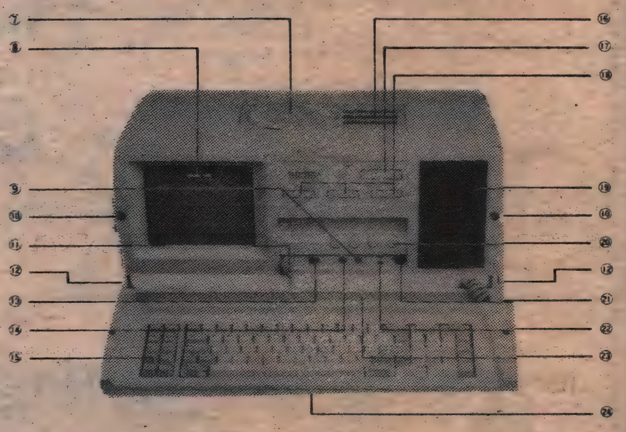

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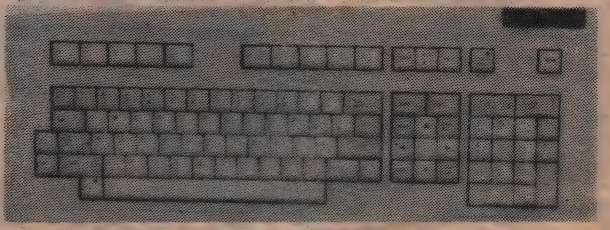

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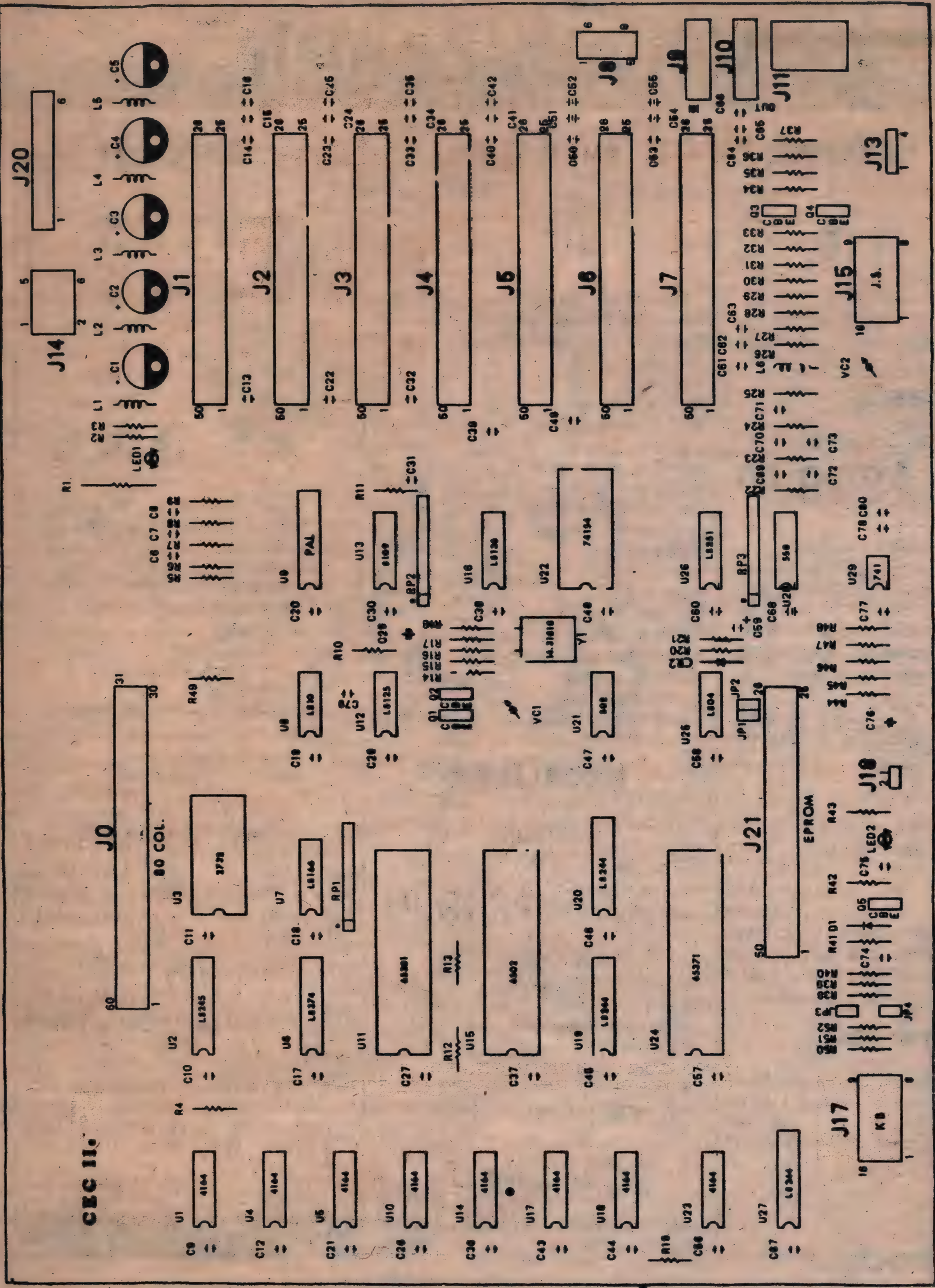

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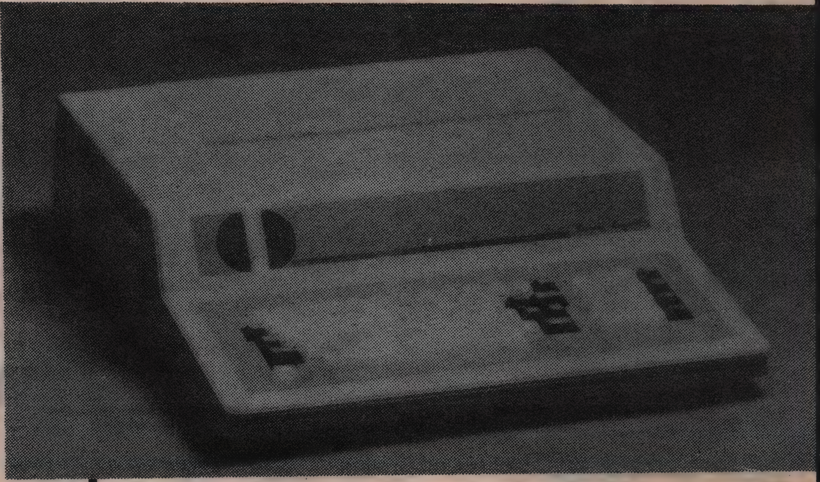

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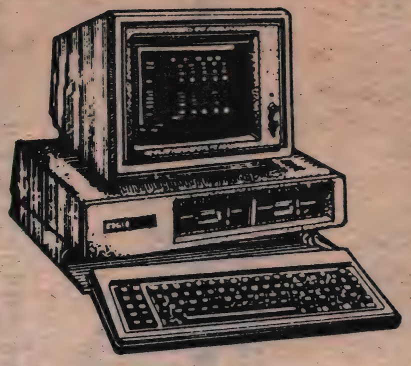

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LP=Low power   Qstat=Quasi-Static

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5v=Single 5 Volt Supply   REFRESH=Pin 1 Refresh

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5V=Single 5 Volt Supply   21V PGM=Program at 21 Volts

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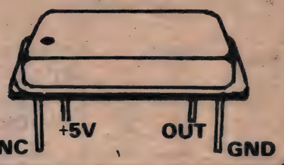

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74LS42	.49	74LS266	.55
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74S114	.55	74S201	6.95	74S474	4.95
74S124	2.75	74S225	7.95	74S570	2.95
74S132	1.24	74S226	3.99	74S571	2.95
74S133	.45	74S240	2.20	74S573	9.95
74S134	.50	74S241	2.20	87S181	16.25
				87S185	16.95

7400

7400	.19	7483	.50	74172	5.95
7401	.19	7485	.59	74173	.75
7402	.19	7486	.35	74174	.89
7403	.19	7489	2.15	74175	.89
7404	.19	7490	.35	74176	.89
7405	.25	7491	.40	74177	.75
7406	.29	7492	.50	74178	1.15
7407	.29	7493	.35	74179	1.75
7408	.24	7494	.65	74180	.75
7409	.19	7495	.55	74181	2.25
7410	.19	7496	.70	74182	.75
7411	.25	7497	2.75	74184	2.00
7412	.30	74100	1.75	74185	2.00
7413	.35	74105	1.14	74189	2.99
7414	.49	74107	.30	74190	1.15
7416	.25	74109	.45	74191	1.15
7417	.25	74110	.45	74192	.79
7420	.19	74111	.55	74193	.79
7421	.35	74116	1.55	74194	.85
7422	.35	74120	1.20	74195	.85
7423	.29	74121	.29	74196	.79
7425	.29	74122	.45	74197	.75
7426	.29	74123	.49	74198	1.35
7427	.29	74125	.45	74199	1.35
7428	.45	74126	.45	74221	1.35
7430	.19	74128	.55	74246	1.35
7432	.29	74132	.45	74247	1.25
7433	.45	74136	.50	74248	1.85
7437	.29	74141	.65	74249	1.95
7438	.29	74142	2.95	74251	.75
7439	.79	74143	4.95	74259	2.25
7440	.19	74144	2.95	74265	1.35
7442	.49	74145	.60	74273	1.95
7443	.65	74147	1.75	74276	1.25
7444	.69	74148	1.20	74278	3.11
7445	.69	74150	1.35	74279	.75
7446	.69	74151	.55	74283	2.00
7447	.69	74152	.65	74284	3.75
7448	.69	74153	.55	74285	3.75
7450	.19	74154	1.25	74290	.95
7451	.23	74155	.75	74293	.75
7453	.23	74156	.65	74298	.85
7454	.23	74157	.55	74351	2.25
7460	.23	74159	1.65	74365	.65
7470	.35	74160	.85	74366	.65
7472	.29	74161	.69	74367	.65
7473	.34	74162	.85	74368	.65
7474	.33	74163	.69	74376	2.20
7475	.45	74164	.85	74390	1.75
7476	.35	74165	.85	74393	1.35
7480	.59	74166	1.00	74425	3.15
7481	1.10	74167	2.96	74426	.85
7482	.95	74170	1.65	74490	2.55

CMOS

4000	.29	4531	.95
4001	.25	4532	1.95
4002	.25	4538	1.95
4006	.89	4539	1.95
4007	.29	4541	2.64
4008	.95	4543	1.19
4009	.39	4553	5.79
4010	.45	4555	.95
4011	.25	4556	.95
4012	.25	4558	2.45
4013	.38	4560	4.25
4014	.79	4569	3.49
4015	.39	4581	1.95
4016	.39	4582	1.95
4017	.69	4584	.75
4018	.79	4585	.75
4019	.39	45151	12.95
4020	.75	4702	12.95
4021	.79	4724	1.50
4022	.79	74C00	.35
4023	.29	74C02	.35
4024	.65	74C04	.35
4025	.29	74C08	.35
4026	1.65	74C10	.35
4027	.45	74C14	.59
4028	.69	74C20	.35
4029	.79	74C30	.35
4030	.39	74C32	.39
4034	1.95	74C42	1.29
4035	.85	74C48	1.99
4040	.75	74C73	.65
4041	.75	74C74	.65
4042	.69	74C76	.80
4043	.85	74C83	1.95
4044	.79	74C85	1.95
4046	.85	74C86	.39
4047	.95	74C89	4.50
4048	.69	74C90	1.19
4049	.35	74C93	1.75
4050	.35	74C95	.99
4051	.79	74C150	5.75
4052	1.99	74C151	2.25
4053	.79	74C154	3.25
4060	.89	74C157	1.75
4066	.39	74C160	1.19
4068	.39	74C161	1.19
4069	.29	74C162	1.19
4070	.35	74C163	1.19
4071	.29	74C164	1.39
4072	.29	74C165	2.00
4073	.29	74C173	.79
4075	.29	74C174	1.19
4076	.79	74C175	1.19
4077	.59	74C192	1.49
4078	.29	74C193	1.49
4081	.29	74C195	1.39
4082	.29	74C200	5.75
4085	.95	74C221	1.75
4086	.95	74C244	2.25
4093	.49	74C373	2.45
4094	2.99	74C374	2.45
4098	2.49	74C901	.39
4099	1.95	74C902	.85
14409	12.95	74C903	.85
14410	12.95	74C905	10.95
14411	11.95	74C906	.95
14412	12.95	74C907	1.00
14419	7.95	74C908	2.00
14433	14.95	74C909	2.75
14490	4.95	74C910	9.95
4502	.95	74C911	8.95
4503	.65	74C912	8.95
4507	1.25	74C914	1.95
4508	1.95	74C915	1.19
4510	.85	74C918	2.75
4511	.85	74C920	17.95
4512	.85	74C921	15.95
4514	1.25	74C922	4.49
4515	1.79	74C923	4.95
4516	1.55	74C925	5.95
4518	.89	74C926	7.95
4519	.39	74C927	7.95
4520	.79	74C928	7.95
4521	4.99	74C929	19.95
4522	1.25	74C930	4.95
4526	1.25	80C95	.85
4527	1.95	80C96	.95
4528	1.19	80C97	.95
4529	2.95	80C98	1.20

HIGH SPEED CMOS

A new family of high speed CMOS logic featuring the speed of low power Schottky (8ns typical gate propagation delay), combined with the advantages of CMOS: very low power consumption, superior noise immunity, and improved output drive.

74HC00

74HC: Operate at CMOS logic levels and are ideal for new, all-CMOS designs.

74HC00	.59	74HC175	.99
74HC02	.59	74HC193	1.25
74HC04	.59	74HC194	1.04
74HC08	.59	74HC195	1.09
74HC10	.59	74HC238	1.35
74HC11	.59	74HC240	1.89
74HC14	.79	74HC241	1.89
74HC20	.59	74HC242	1.89
74HC27	.59	74HC243	1.89
74HC30	.59	74HC244	1.89
74HC32	.69	74HC245	1.89
74HC51	.59	74HC251	.89
74HC74	.75	74HC257	.85
74HC75	.85	74HC259	1.39
74HC85	1.35	74HC273	1.89
74HC86	.69	74HC299	4.99
74HC93	1.19	74HC367	.99
74HC125	1.19	74HC373	2.29
74HC132	1.19	74HC374	2.29
74HC138	.99	74HC393	1.39
74HC139	.99	74HC4017	1.99
74HC151	.89	74HC4020	1.39
74HC153	.89	74HC4024	1.59
74HC154	2.49	74HC4040	1.39
74HC157	.89	74HC4049	.89
74HC161	1.15	74HC4050	.89
74HC164	1.25	74HC4060	1.29
74HC166	2.95	74HC4511	2.39
74HC174	.99	74HC4538	2.29

74HCT00

74HCT: Direct, drop-in replacements for LS TTL and can be intermixed with 74LS in the same circuit.

74HCT00	.69	74HCT175	1.09
74HCT02	.69	74HCT193	1.39
74HCT04	.69	74HCT194	1.19
74HCT08	.69	74HCT195	1.29
74HCT10	.69	74HCT238	1.49
74HCT11	.69	74HCT240	2.19
74HCT14	.89	74HCT241	2.19
74HCT20	.69	74HCT242	2.19
74HCT27	.69	74HCT243	2.19
74HCT30	.69	74HCT244	2.19
74HCT32	.79	74HCT245	2.19
74HCT51	.69	74HCT251	1.09
74HCT74	.85	74HCT257	.99
74HCT75	.95	74HCT259	1.59
74HCT85	1.49	74HCT273	2.09
74HCT86	.79	74HCT299	5.25
74HCT93	1.29	74HCT367	1.09
74HCT125	1.29	74HCT373	2.49
74HCT132	1.29	74HCT374	2.49
74HCT138	1.15	74HCT393	1.59
74HCT139	1.15	74HCT4017	2.19
74HCT151	1.05	74HCT4020	1.59
74HCT153	1.05	74HCT4024	1.79
74HCT154	2.99	74HCT4040	1.59
74HCT157	.99	74HCT4049	.99
74HCT161	1.29	74HCT4050	.99
74HCT164	1.39	74HCT4060	1.49
74HCT166	3.05	74HCT4511	2.69
74HCT174	1.09	74HCT4538	2.59

SPECTRONICS CORPORATION

EPROM ERASERS

	Timer	Capacity Chip	Intensity (uW/Cm^2)	
PE-14		9	8,000	$83.00
PE-14T	x	9	8,000	$119.00
PE-24T	x	12	9,600	$175.00
PL-265T	x	30	9,600	$255.00
PR-125T	x	25	17,000	$349.00
PR-320T	x	42	17,000	$595.00

VOLTAGE REGULATORS

TO-220 CASE PACKAGE

7805T	.75	7905T	.85
7808T	.75	7908T	.85
7812T	.75	7912T	.85
7815T	.75	7915T	.85
7824T	.75	7924T	.85

TO-3 CASE PACKAGE

7805K	1.39	7905K	1.49
7812K	1.39	7912K	1.49
7815K	1.39	7915K	1.49
7824K	1.39	7924K	1.49

TO-92 CASE PACKAGE

78L05	.69	79L05	.79
78L12	.69	79L12	.79
78L15	.69	79L15	.79

OTHER VOLTAGE REGS

78M05C	5volt	½amp	TO-220	.35
LM323K	5volt	3amp	TO-3	4.95
LM338K	Adj.	5amp	TO-3	3.95
78H05K	5volt	5amp	TO-3	9.95
78H12K	12volt	5amp	TO-3	9.95
78P05K	5volt	10amp	TO-3	14.95
UA78S40	FAIRCHILD		DIP	1.95

LINEAR

LM301	.34	NE570	3.95
LM301H	.79	NE571	2.95
LM307	.45	NE590	2.50
LM308	.69	NE592	.98
LM308H	1.15	LM709	.59
LM309H	1.95	LM710	.75
LM309K	1.25	LM711	.79
LM310	1.75	LM723	.49
LM311	.64	LM723H	.55
LM311H	.89	LM733	.98
LM312H	1.75	LM741	.35
LM317K	3.95	LM741N-14	.35
LM317T	1.19	LM741H	.40
LM318	1.49	LM747	.69
LM318H	1.59	LM748	.59
LM319H	1.90	LM1014	1.19
LM319	1.25	LM1303	1.95
LM320	see7900	LM1310	1.49
LM322	1.65	MC1330	1.69
LM323K	4.95	MC1349	1.89
LM324	.59	MC1350	1.19
LM329	.65	MC1358	1.69
LM331	3.95	MC1372	6.95
LM334	1.19	LM1414	1.59
LM335	1.40	LM1458	.59
LM336	1.75	LM1488	.69
LM337T	1.95	LM1489	.69
LM337K	3.95	LM1496	.85
LM338K	3.95	LM1558H	3.10
LM339	.99	LM1800	2.37
LM340	see7800	LM1812	8.25
LM348	.99	LM1830	3.50
LM350K	4.95	LM1871	5.49
LM350T	4.60	LM1872	5.49
LM358	.69	LM1877	3.52
LM359	1.79	LM1889	1.95
LM376	3.75	LM1896	1.75
LM377	1.95	ULN2003	1.29
LM378	2.50	XR2206	3.75
LM379	4.50	LM2877	2.05
LM380	.89	LM2878	2.25
LM380N-8	1.10	LM2900	.85
LM381	1.60	LM2901	1.00
LM382	1.60	MPQ2907	1.95
LM383	1.95	LM2917	2.95
LM384	1.95	MC3487	2.95
LM386	.89	LM3900	.59
LM387	1.40	LM3905	1.25
LM389	1.35	LM3909	.98
LM390	1.95	LM3911	2.25
LM392	.69	LM3914	3.95
LM393	1.29	LM3915	3.95
LM394H	4.60	LM3916	3.95
LM399H	5.00	MC4024	3.95
NE531	2.95	MC4044	4.50
NE555	.34	RC4136	1.25
NE556	.65	RC4151	3.95
NE558	1.50	LM4250	1.75
NE564	2.95	LM4500	3.25
LM565	.99	RC4558	.69
LM566	1.49	LM13600	1.49
LM567	.89	LM13700	1.45

H=TO-5 CAN, K=TO-3, T=TO-220

RCA

CA3023	2.75	CA3083	1.55
CA3039	1.29	CA3086	.80
CA3046	1.25	CA3089	2.99
CA3059	2.90	CA3096	3.49
CA3060	2.90	CA3130	1.30
CA3065	1.75	CA3140	1.15
CA3080	1.10	CA3146	1.85
CA3081	1.65	CA3160	1.19
CA3082	1.65	CA3183	.99

TI

TL494	4.20	75365	1.95
TL496	1.65	75450	.59
TL497	3.25	75451	.39
75107	1.49	75452	.39
75108	1.49	75453	.39
75110	1.95	75454	.39
75150	1.95	75477	1.29
75154	1.95	75491	.79
75160	4.95	75492	.79
75188	1.25	75493	.89
75189	1.25	75494	.89

BI FET

TL066	.99	LF347	2.19
TL071	.79	LF351	.60
TL072	1.19	LF353	1.00
TL074	2.19	LF355	1.10
TL081	.79	LF356	1.10
TL082	1.19	LF357	1.40
TL083	1.19	LF411	1.29
TL084	2.19	LF412	1.99

TRANSISTORS

2N918	.50	2N3772	1.85
MPS918	.25	2N3903	.25
2N2102	.75	2N3904	.10
2N2218	.50	2N3906	.10
2N2218A	.50	2N4122	.25
2N2219	.50	2N4123	.25
2N2219A	.50	2N4249	.25
2N2222	.25	2N4304	.75
PN2222	.10	2N4401	.25
MPS2369	.25	2N4402	.25
2N2484	.25	2N4403	.25
2N2905	.50	2N4857	1.00
2N2907	.25	PN4916	.25
PN2907	.13	2N5086	.25
2N3055	.79	PN5129	.25
3055T	.69	PN5139	.25
2N3393	.30	2N5209	.25
2N3414	.25	2N6028	.35
2N3563	.40	2N6043	1.75
2N3565	.40	2N6045	1.75
PN3565	.25	MPS-A05	.25
MPS3638	.25	MPS-A06	.25
MPS3640	.25	MPS-A13	.40
PN3643	.25	MPS-A55	.25
PN3644	.25	MPU-131	.99
MPS3704	.15	TIP29	.65
MPS3706	.15	TIP31	.75
		TIP32	.79

IC SOCKETS

	1-99	100
8 PIN ST	.13	.11
14 PIN ST	.15	.12
16 PIN ST	.17	.13
18 PIN ST	.20	.18
20 PIN ST	.29	.27
22 PIN ST	.30	.27
24 PIN ST	.30	.27
28 PIN ST	.40	.32
40 PIN ST	.49	.39
64 PIN ST	4.25	CALL

ST=SOLDERTAIL

	1-99	100
8 PIN WW	.59	.49
14 PIN WW	.69	.52
16 PIN WW	.69	.58
18 PIN WW	.99	.90
20 PIN WW	1.09	.98
22 PIN WW	1.39	1.28
24 PIN WW	1.49	1.35
28 PIN WW	1.69	1.49
40 PIN WW	1.99	1.80

WW=WIREWRAP

INTERFACE

8T26	1.59
8T28	1.98
8T95	.89
8T96	.89
8T97	.89
8T98	.89
DM8131	2.95
DP8304	2.29
DS8833	2.25
DS8835	1.99
DS8836	.99
DS8837	1.65
DS8838	1.30

INTERSIL

ICL7106	9.95
ICL7107	12.95
ICL7660	2.95
ICL8038	3.95
ICM7207A	5.59
ICM7208	15.95

DATA ACQ

ADC0800	15.55
ADC0804	3.49
ADC0809	4.49
ADC0816	14.95
ADC0817	9.95
ADC0831	8.95
DAC0800	4.49
DAC0806	1.95
DAC0808	2.95
DAC1020	8.25
DAC1021	7.95
DAC1022	5.95
MC1408L6	1.95
MC1408L8	2.95

EXAR

XR2206	3.75
XR2207	3.75
XR2208	3.75
XR2211	5.25
XR2240	3.25

9000

9304	.95
9316	1.00
9328	1.49
9334	2.50
9368	3.95
9401	9.95
9601	.75
9602	1.50
9637	2.95
96S02	1.95

SOUND CHIPS

76477	3.95
76488	5.95
76489	8.95
SSI-263	39.95
AY3-8910	12.95
AY3-8912	12.95
MC3340	1.49
SP1000	39.00

OPTO-ISOLATORS

4N26	1.00	MCA-7	4.25
4N27	1.10	MCA-255	1.75
4N28	.69	IL-1	1.25
4N33	1.75	ILA-30	1.25
4N35	1.25	ILQ-74	2.75
4N37	1.25	H11C5	1.25
MCT-2	1.00	TIL-111	1.00
MCT-6	1.50	TIL-113	1.75

I'm writing to thank you again for the out-standing spirit of service to customers with which you handled our telephone order today. The high level of service orientation you exhibit is rarely found these days.

It is gratifying to find you as a supplier who stocks electronic components we often find difficult to obtain ... we will surely look on you as a preferred supplier.

— C. K. Fulton

VISA

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DB25S RS232 FEMALE SOLDER CUP 2.25 DB25P RS232 MALE SOLDER CUP 1.90

BARGAIN HUNTERS CORNER

DYNAMIC RAMS

41256	256K	200ns	$10.95
4164	64K	200ns	9/$19.95

STATIC RAMS

HM6264	8Kx8	[illegible]	CMOS	$17.95
TMM2016	2Kx8	[illegible]		$3.25
HM6116	2Kx8	[illegible]0ns	CMOS	$3.69

EPROMS

27128	16Kx8	[illegible]	$13.95
2764	8Kx8	450ns	$4.95
2732	4Kx8	450ns	$4.25

MATH CO-PROCESSOR CHIPS

8087-3	INTEL	$129.00
8087-6	INTEL	$119.00

SPECIALS ENDS 4/30/85

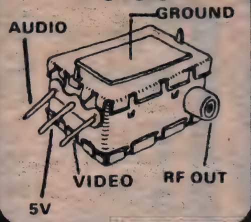
RF MODULATOR

(ASTEC UM1082)

QUANTITIES LIMITED

- PRESET TO CHANNEL 3
- USE TO BUILD TV-COMPUTER INTERFACE
- +5 VOLT OPERATION

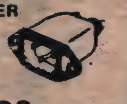
$6.95



EMI FILTER

- MAJOR MANUFACTURER
- LOW COST
- FITS LC-HP BELOW

$4.95



LINE CORDS

LC-2	2 CONDUCTOR	6 ft	.39
LC-3	3 CONDUCTOR	6 ft	.99
LC-HP	3 CONDUCTOR WITH STANDARD FEMALE SOCKET	6 ft	1.49
LC-CIR	CIGARETTE LIGHTER PLUG WITH 6 ft COILED CORD		2.95

MUFFIN FANS

4.68" SQUARE	14.95
3" SQUARE	14.95

RESISTORS

¼ WATT 5% CARBON FILM
ALL STANDARD VALUES
FROM 1 OHM TO 10 MEG OHM

50 PIECES SAME VALUE	.025
100 PIECES SAME VALUE	.02
1000 PIECES SAME VALUE	.015

CAPACITORS

TANTALUM

1.0µf	15V	.40	.47µf	35V	.50
6.8	15V	.70	1.0	35V	.45
10	15V	.80	2.2	35V	.65
22	15V	1.35	4.7	35V	.85
.22	35V	.40	10	35V	1.00

DISC

10pf	50V	.05	560	50V	.05
22	50V	.05	680	50V	.05
25	50V	.05	820	50V	.05
27	50V	.05	.001µf	50V	.05
33	50V	.05	.0015	50V	.05
47	50V	.05	.0022	50V	.05
56	50V	.05	.005	50V	.05
68	50V	.05	.01	50V	.07
82	50V	.05	.02	50V	.07
100	50V	.05	.05	50V	.07
220	50V	.05	.1	12V	.10

MONOLITHIC

.01µf	50V	.14	.1µf	50V	.18
.047µf	50V	.15	.47µf	50V	.25

ELECTROLYTIC

RADIAL			AXIAL		
1µf	25V	.14	1µf	50V	.14
2.2	35V	.15	4.7	16V	.14
4.7	50V	.15	10	16V	.14
10	50V	.15	10	50V	.16
47	35V	.18	22	16V	.14
100	16V	.18	47	50V	.20
220	35V	.20	100	15V	.20
470	25V	.30	100	35V	.25
2200	16V	.60	220	25V	.30
			330	16V	.40
			500	16V	.42
			1000	16V	.60
			2200	16V	.70
			6000	16V	.85

COMPUTER GRADE

44,000µf 30V 3.95

HARD TO FIND "SNAPABLE" HEADERS

Can easily be snapped apart to make any size header, all with .1" centers

1x40	STRAIGHT LEAD	1.99
1x40	RIGHT ANGLE	1.49
2x40	STRAIGHT LEAD	2.49
2x40	RIGHT ANGLE	2.99

SHORTING BLOCKS

SPACED AT .1" CENTERS
IDEAL FOR DISK DRIVES
OR ANY .1" HEADER

5/1.00

DIP SWITCHES

4 POSITION	.85
5 POSITION	.90
6 POSITION	.90
7 POSITION	.95
8 POSITION	.95
10 POSITION	1.29

EDGECARD CONNECTORS

S-100 ST	S-100	3.95
S-100 WW	S-100	4.95
72 PIN ST		6.95
72 PIN WW		7.95
62 PIN ST	IBM PC	4.95
50 PIN ST	APPLE	4.95
44 PIN ST		2.95
44 PIN WW		4.95

36 PIN CENTRONICS

IDCEN36	RIBBON CABLE MALE	8.95
IDCEN36 F	RIBBON CABLE FEMALE	8.95
CEN36	SOLDER CUP MALE	7.95

BYPASS CAPS

.01 µf DISC	100/$6.00
.01 µf MONOLITHIC	100/$12.00
.1 µf DISC	100/$8.00
.1 µf MONOLITHIC	100/$15.00

DIODES

1N751	5.1 VOLT ZENER	.25
1N759	12.0 VOLT ZENER	.25
1N4148	(1N914)SWITCHING	25/1.00
1N4001	50PIV 1A	12/1.00
1N4004	400PIV RECTIFIER	10/1.00
1N5402	200PIV 3A	.25
KBP02	200PIV 1.5A BRIDGE	.45
KBP04	400PIV 1.5A BRIDGE	.55
MDA801	50PIV 12A BRIDGE	1.39
MDA980-1	50PIV 12A BRIDGE	1.95
MDA980-2	100PIV 12A BRIDGE	2.25
VM48	DIP-BRIDGE	.35

LED DISPLAYS

HP5082-7760	CC	.43"	1.29
MAN-72	CA	.3"	.99
MAN-74	CC	.3"	.99
FND-357(359)	CC	.375"	1.25
FND-500(503)	CC	.5"	1.49
FND-507(510)	CA	.5"	1.49
TIL-311 4x7 HEX W/LOGIC		.270"	9.95

DIP CONNECTORS

DESCRIPTION	ORDER BY	CONTACTS								
		8	14	16	18	20	22	24	28	40
HIGH RELIABILITY TOOLED ST IC SOCKETS	AUGATxxST	.99	.99	.99	1.69	1.89	1.89	1.99	2.49	2.99
HIGH RELIABILITY TOOLED WW IC SOCKETS	AUGATxxWW	1.30	1.80	2.10	2.40	2.50	2.90	3.15	3.70	5.40
COMPONENT CARRIES (DIP HEADERS)	ICCxx	.49	.59	.69	.99	.99	.99	.99	1.09	1.49
RIBBON CABLE DIP PLUGS (IDC)	IDPxx	---	.95	.95	---	---	---	1.75	---	2.95

FOR ORDERING INSTRUCTIONS SEE IDC CONNECTORS BELOW

HEAT SINKS

TO-220	SCREW ON	.35
TO-220	CLIP ON	.35
TO-3	SCREW ON	.95
TO-220	INSULATOR	10 1.00
TO-3	INSULATOR	10 1.00

SWITCHES

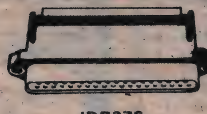
SPDT	MINI-TOGGLE ON-ON	1.25
DPDT	MINI-TOGGLE ON-ON	1.50
DPDT	MINI-TOGGLE ON-OFF-ON	1.75
SPST	MINI-PUSHBUTTON N.O.	.39
SPST	MINI-PUSHBUTTON N.C.	.39
BCD OUT	10 POSITION 6 PIN DIP	1.95

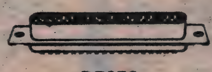
DIFFUSED LEDS

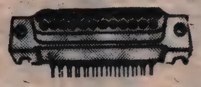
		1-99	100-up
JUMBO RED	T1¾	.10	.09
JUMBO GREEN	T1¾	.18	.15
JUMBO YELLOW	T1¾	.18	.15
MOUNTING HDW	T1¾	.10	.09
MINI RED	T1	.10	.09
MINI GREEN	T1	.18	.15
MINI YELLOW	T1	.18	.15
RECT RED	2x5mm	.25	.22
RECT GREEN	2x5mm	.30	.27
RECT YELLOW	2x5mm	.30	.27

D-SUBMINIATURE

DESCRIPTION		ORDER BY	CONTACTS				
			9	15	25	37	50
SOLDER CUP	MALE	DBxxP	1.19	1.59	1.90	2.85	4.25
	FEMALE	DBxxS	1.50	1.85	2.25	3.90	5.25
RIGHT ANGLE PC SOLDER	MALE	DBxxPR	1.65	2.20	3.00	4.83	---
	FEMALE	DBxxSR	2.18	3.03	3.00	6.19	---
WIRE WRAP	MALE	DBxxPWW	1.69	2.56	3.89	5.60	---
	FEMALE	DBxxSWW	2.76	4.27	6.84	9.95	---
IDC RIBBON CABLE	MALE	IDBxxP	2.95	3.90	4.75	6.95	---
	FEMALE	IDBxxS	3.25	4.29	5.25	7.95	---
HOODS	BLACK	HOOD-B	---	---	.99	---	---
	GREY	HOOD	.89	.99	.99	1.09	1.19


IDB37S

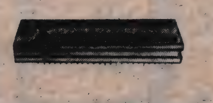

DB37S

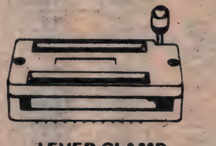

DB25SR

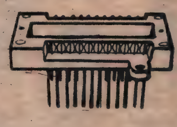
MOUNTING HARDWARE-$1.00

FOR ORDERING INSTRUCTIONS SEE IDC CONNECTORS BELOW

TEXTOOL ZERO INSERTION FORCE SOCKETS AND RECEPTACLES


SCREWDRIVER CLAMP
ECONO ZIF

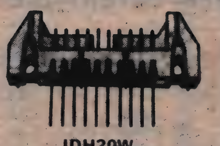

LEVER CLAMP
ZIF SOCKET

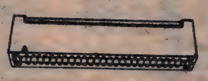

WW RECEPTACLES
ZIF RECEPTACLE

TYPE	CONTACTS				
	14	16	24	28	40
ECONO ZIF	---	4.95	6.75	7.75	9.95
ZIF SOCKET	4.95	4.95	5.95	6.95	9.95
ZIF RECEPTACLE	8.25	8.75	9.75	10.50	12.75

IDC CONNECTORS

DESCRIPTION	ORDER BY	CONTACTS					
		10	20	26	34	40	50
SOLDER HEADER	IDHxxS	.82	1.29	1.68	2.20	2.58	3.24
RIGHT ANGLE SOLDER HEADER	IDHxxSR	.85	1.35	1.76	2.31	2.72	3.39
WW HEADER	IDHxxW	1.86	2.98	3.84	4.50	5.28	6.63
RIGHT ANGLE WW HEADER	IDHxxWR	2.05	3.28	4.22	4.45	4.80	7.30
RIBBON HEADER SOCKET	IDSxx	.79	.99	1.39	1.59	1.99	2.25
RIBBON HEADER	IDMxx	---	5.50	6.25	7.00	7.50	8.50
RIBBON EDGE CARD	IDExx	1.75	2.25	2.65	2.75	3.80	3.95


IDH20W


IDE50

ORDERING INSTUCTIONS: INSERT THE NUMBER OF CONTACTS IN THE POSITION MARKED "xx" OF THE "ORDER BY" PART NUMBER LISTED. EXAMPLE: A 10 PIN RIGHT ANGLE HOLDER STYLE WOULD BE IDH10SR

RIBBON CABLE

CONTACTS	SINGLE COLOR		COLOR CODED	
	1'	10'	1'	10'
10	.18	1.60	.83	7.30
16	.28	2.50	1.00	8.80
20	.36	3.20	1.25	11.00
25	.45	4.00	1.32	11.60
26	.46	4.10	1.32	11.60
34	.61	5.40	1.65	14.50
40	.72	6.40	1.92	16.80
50	.89	7.50	2.50	22.00

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TERMS: Minimum order $10.00. For shipping and handling include $2.50 for UPS Ground and $3.50 for UPS Air. Orders over 1 lb. and foreign orders may require additional shipping charges - please contact our sales department for the amount. CA. residents must include 6% sales tax. Bay Area and LA residents include 6½%. All merchandise is warranted for 90 days unless otherwise stated. Prices are subject to change without notice. We are not responsible for typographical errors. We reserve the right to limit quantities and to substitute manufacturer. All merchandise subject to prior sale.

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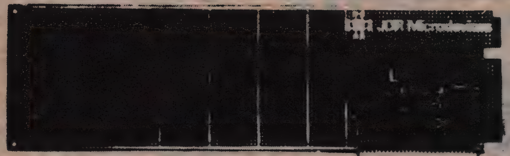
IBM PC PROTOTYPE CARD WITH DECODING CIRCUITRY $29.95

WIRE WRAP PROTOTYPE CARDS

FR-4 EPOXY GLASS LAMINATE WITH GOLD-PLATED EDGE-CARD FINGERS



IBM-PR2

IBM

BOTH CARDS HAVE SILK SCREENED LEGENDS AND INCLUDES MOUNTING BRACKET

IBM-PR1	WITH +5V AND GROUND PLANE	$27.95
IBM-PR2	AS ABOVE WITH DECODING CIRCUITRY	$29.95

S-100

P100-1	BARE - NO FOIL PADS	$15.15
P100-2	HORIZONTAL BUS	$21.80
P100-3	VERTICAL BUS	$21.80
P100-4	SINGLE FOIL PADS PER HOLE	$22.75

APPLE

P500-1	BARE - NO FOIL PADS	$15.15
P500-3	HORIZONTAL BUS	$22.75
P500-4	SINGLE FOIL PADS PER HOLE	$21.80
7060-45	FOR APPLE IIe AUX SLOT	$30.00

GENERAL PURPOSE

22/44 PIN EDGE-CARD (.156" SPACING)

P441-1	BARE - NO FOIL PADS 4.5" x 6.0"	$9.45
P441-3	VERTICAL BUS 4.5" x 6.0"	$13.95
P441-4	SINGLE FOIL PADS 4.5" x 6.0"	$14.20
P442-1	BARE - NO FOIL PADS 4.5" x 9.0"	$10.40
P442-3	VERTICAL BUS 4.5" x 9.0"	$14.20
P442-4	SINGLE FOIL PADS 4.5" x 9.0"	$13.50

36/72 PIN EDGE-CARD (.1" SPACING)

P721-1	BARE - NO FOIL PADS 4.5" x 6.0"	$9.45
P721-3	VERTICAL BUS 4.5" x 6.0"	$13.25
P721-4	SINGLE FOIL PADS 4.5" x 6.0"	$14.20
P722-1	BARE - NO FOIL PADS 4.5" x 9.0"	$10.40
P722-3	VERTICAL BUS 4.5" x 9.0"	$14.20
P722-4	SINGLE FOIL PADS 4.5" x 9.0"	$15.15

BARE GLASS BOARDS

NO EDGE-CARD FINGERS OR FOIL

P25x45	2.5" x 4.5"	$2.40
P45x65	4.5" x 6.5"	$4.70
P45x85	4.5" x 8.5"	$6.20
P45x170	4.5" x 17.0"	$11.35
P85x170	8.5" x 17.0"	$18.95

EXTENDER CARDS

IBM	$45.00
APPLE	$45.00
MULTIBUS	$86.00

DISK DRIVES

TANDON

TM 100-1 5¼" (FOR IBM) SS/DD	$139.95
TM 100-2 5¼" (FOR IBM) DS/DD	$159.95

MPI

MPI-B52 5¼" (FOR IBM) DS/DD	$109.95

TEAC

FD-55B ½ HEIGHT DS/DD	$129.95
FD-55F ½ HEIGHT DS/QUAD	$139.95

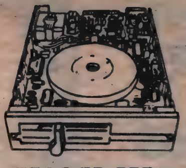
SHUGART

SA 400L 5¼" (40 TRACK) SS/DD	$199.95
SA 460 5¼" (80 TRACK) DS/QUAD	$199.95

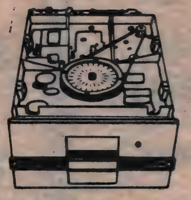
8" DISK DRIVES

FD100-8 BY SIEMENS, SHUGART 801 EQUIV. SS/DD	$129.00
FD200-8 BY SIEMENS, SHUGART 851 EQUIV. DS/DD	$180.00

JFORMAT-2 $49.95
SUPPORT FOR QUAD DENSITY DRIVES
FROM TALL TREE SYSTEMS



TEAC FD-55B



TANDON TM100-2

PLEASE INCLUDE SUFFICENT AMOUNT FOR SHIPPING ON ABOVE ITEMS

DISK DRIVE CABINETS

CABINET #1 $29.95

- Fits one full height 5¼"disk drive
- Color matches Apple

CABINET #2 $79.00

- Fits one full height 5¼"disk drive
- Complete with power supply, switch, line cord, fuse and standard power connector
- Please specify Grey or Tan

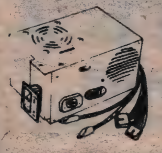
CABINET #3 $89.95

- Fits two half height 5¼"disk drives
- Complete with power supply, switch, line cord, fuse and standard power connectors

8" DISK DRIVE CABINETS ALSO AVAILABLE-PLEASE CALL

PLEASE INCLUDE SUFFICIENT AMOUNT FOR SHIPPING ON ABOVE ITEMS

SWITCHING POWER SUPPLIES



PS-IBM $175.00

- FOR IBM PC-XT COMPATIBLE
- 130 WATTS
- +5V @ 15A, +12V @ 4.2A -5V @ .5A, -12V @ .5A
- ONE YEAR WARRANTY

PS-A $49.95

- USE TO POWER APPLE TYPE SYSTEMS
- +5V @ 4A, +12V @ 2.5A -5V @ .5A, -12V @ .5A
- APPLE POWER CONNECTOR

PS-3 $39.95

- AS USED IN APPLE III
- +5V @ 4A, +12V @ 2.5A -5V @ .25A, -12V @ .30A,
- 15.5" x 4.5" x 2", .884 LBS.

PS-ASTEC $19.95

- CAN POWER TWO 5¼" FDDS
- +5V @ 2.5A, +12V @ 2A -12V @ .1A
- +5V @ 5A IF +12V IS NOT USED
- 6.3" x 4.0" x 1.9"

OK INDUSTRIES

EX-1 IC EXTRACTION TOOL

- ONE PIECE METAL CONSTRUCTION
- EASILY EXTRACTS 8-24 PIN DEVICES
- LOW COST $2.19

EX-1

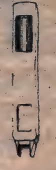
EX-2 IC EXTRACTION TOOL

- EXTRACTS 24-40 PIN DEVICES
- HEAVY DUTY METAL CONSTRUCTION
- GROUND LUGS FOR MOS EXTRACTIONS
- EASY ONE HAND OPERATION $12.74

IC INSERTION TOOLS

INS-1416	for 14-16 pin IC's	$5.15
MOS-1416	for 14-16 pin IC's	$10.92
MOS-2428	for 24-28 pin IC's	$10.92
MOS-40	for 40 pin IC's	$12.43

MOS series insertion tools have metal constuction and include grounding lug for CMOS applications.



INS-1416

INS-2428

BW-630 WIRE WRAP GUN

- BATTERY POWERED-USES 2 NI-CAD C CELLS(NOT INCLUDED)
- POSITIVE INDEXING
- ANTI-OVERWRAP DEVICE $41.55

BW-630

WSU-30 WIRE WRAP TOOLS

- WRAPS, STRIPS, AND UNWRAPS
- WSU-30M WRAPS AN EXTRA TURN OF INSULATION

WSU-30 $8.84/WSU-30M $10.14

WIRE WRAP TERMINALS

WWT-1	SLOTTED	25/$7.06
WWT-2	SINGLE SIDED	25/$4.25
WWT-3	IC SOCKET	25/$7.06
WWT-4	DOUBLE SIDED	25/2.80
INS-1	INSERTION TOOL	$3.64

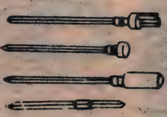
WSU-30/30M

WIRE DISPENSER

- WITH 50' ROLL OF WIRE
- BUILT IN PLUNGER CUTS WIRE
- BUILT IN STRIPPER STRIPES 1"
- REFILLABLE

WD-30 $6.50 Specify Blue, white, Yellow or Red

WD-30TRI $9.50 With 50' of each: Red, Blue and White

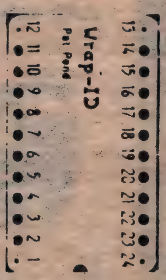


SOCKET-WRAP I.D.™

- SLIPS OVER WIRE WRAP PINS
- IDENTIFIES PIN NUMBERS ON WRAP SIDE OF BOARD
- CAN WRITE ON PLASTIC; SUCH AS IC #

PINS	PART#	PCK. OF	PRICE
8	IDWRAP 08	10	1.95
14	IDWRAP 14	10	1.95
16	IDWRAP 16	10	1.95
18	IDWRAP 18	5	1.95
20	IDWRAP 20	5	1.95
22	IDWRAP 22	5	1.95
24	IDWRAP 24	5	1.95
28	IDWRAP 28	5	1.95
40	IDWRAP 40	5	1.95

PLEASE ORDER BY NUMBER OF PACKAGES (PCK. OF)



WIRE WRAP WIRE

PRECUT AND STRIPPED

Note: 1 inch of insulation is stripped on each end. A 3.5" wire has only 1.5" of insulation.

LENGTH (INCHES)	QUANTITY 100	500	1000
2.5	1.60	4.70	8.20
3	1.60	4.70	8.20
3.5	1.65	5.00	8.90
4	1.75	5.40	9.60
4.5	1.80	5.75	10.30
5	1.85	6.10	11.00
5.5	1.90	6.50	11.75
6	2.00	6.85	12.50
6.5	2.30	7.80	14.30
7	2.40	8.20	15.05
7.5	2.50	8.55	15.85
8	2.60	8.95	16.60
8.5	2.65	9.30	17.40
9	2.70	9.80	18.15
9.5	2.80	10.00	18.95
10	2.90	10.50	19.70

PRECUT ASSORTMENT IN ASSORTED COLORS $27.50

100ea: 5.5", 6", 6.5", 7"
250ea: 2.5", 4.5", 5"
500ea: .3", 3.5", 4"

SPOOLS

100 feet	$4.30	250 feet	$7.25
500 feet	$13.25	1000 feet	$21.95

Please specify color:
Blue, Black, Yellow or Red

TRANSFORMERS

FRAME STYLE

12.6V AC	2 AMP	4.95
12.6V AC CT	2 AMP	5.95
12.6V AC CT	4 AMP	7.95
12.6V AC CT	8 AMP	10.95
25.2V AC CT	2 AMP	7.95

PLUG CASE STYLE

12V AC	250ma	3.95
12V AC	500ma	4.95
12V AC	1 AMP	5.95
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DC ADAPTER

6, 9, 12V DC SELECTABLE WITH UNIVERAL ADAPTER 8.95

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AA CELLS	QTY. 2	$11.71
C CELLS	QTY. 2	$13.21
D CELLS	QTY. 2	$13.21
9 VOLT	QTY. 1	$13.21

BATTERIES ONLY

AAA CELLS	PKG. 2	$6.07 pr.
AA CELLS	PKG. 1	$3.03 ea.
C CELLS	PKG. 1	$3.78 ea.
D CELLS	PKG. 1	$3.78 ea.
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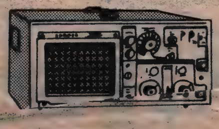

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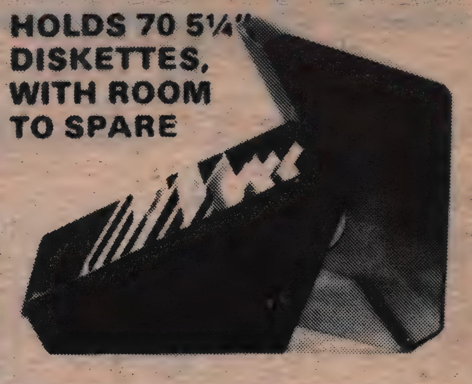

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Nevada Pilot

Continued from page 60

tion program. Specifically certain commands in the reference manual did not execute, or "went into the weeds." For example, the LIST command lists a program in the buffer to the CRT screen, but LIST has problems. One option while listing, is to be able to halt the text by depressing the "space bar," as it scrolls up on the screen. The manual states to resume the text scrolling, "when another key is depressed." Depressing another key actually causes PILOT, if in "Run" mode, to "run in a loop" without any apparent recovery (less a "SYSTEM RESET"). Another problem noted was: LIST:P, a command that is to list the program both on the screen and the printer (CPM list device) did not function. A "work around" discovered for this lack of print, out of a program listing, was another option listed in the manual. Setting a flag to enable hardcopy printout of screen displayed text, (SET P = 1) enabled the CPM list device, and worked as stated in the reference manual.

The basic commands in PILOT programming are:

- T: (similar to a BASIC PRINT statement);
- U: (label), (similar to a GOSUB in BASIC except instead of a line number, a label name is used), (label names in my program are identified with a preceding asterisk (*));
- M: a string matching command (somewhat unique to PILOT);
- C: compute command, (similar to a LET statement in BASIC). Note: PILOT only

Continued on page 136

```
FILE NAME= B:ART.PLT       PROGRAM/TEXT LISTING

R:BEGIN ART TEST
CH:
J (N=1) : *Q1
J (N=2) : *Q2
J (N=3) : *Q3
J (N=4) : *Q4
J (N=5) : *Q5
*Q1
T: The American artist who painted 'Rolling Sea' in 1903
 : Last name begins with an H.
A: $name
M: HENRI
U: *DSP
T: His full name is Robert Henri.
J: *term
*Q2
T: The American artist who painted 'Garden of Eden" c.1860.
 : Last name begins with a F.
A: $name
M: FIELD
U: *DSP
T: His full name is Erastus Salisbury Field.
J: *term
*Q3
T: An artist at 27 years of age, a suicide at 37.
 : Last name begins with a G.
A: $name
M: GOGH
U: *DSP
T: His full name is Vincent van Gogh.
J: *term
*Q4
T: Degas painted his portrait. A French painter who painted
 : 'Portsmouth Dockyard'.  Last name begins with a T.
A: $name
M: Tissot
U: *DSP
T: His full name is James Tissot.
J: *term
*Q5
T: French artist who was a customs clerk.  Last name begins with an R.
A: $name
M: Rousseau
U: *DSP
T: His full name is Henri Rousseau.
 :
*DSP
  TY: CORRECT
  TN: INCORRECT
    E:
R: RETURN TO OPTION PGM
*TERM
PA:4
LOAD:S-QUIZ
E:
```

```
FILE NAME= B:S-QUIZ.PLT   PROGRAM/TEXT LISTING

*START
    CH:
     T: SELECT CATEGORY BY ENTERING
      :
      : ART
      : BIOLOGY
      : SCIENCE
      : HISTORY
      : QUIT
      :
     A: $SELECT
     M: ART
    JY: *ART1
     M: BIOLOGY
    JY: *BIO1
     M: SCIENCE
    JY: *SCI1
     M: HISTORY
    JY: *HIS1
     M: QUIT
    JY: *FIN
    JN: *START
*ART1 C: A=A+1
       R: TALLY NO. OF TIMES SELECTED
       C: N=A
       LOAD:$SELECT
*BIO1
       C: B=B+1
       R: TALLY NO. OF TIMES BIO SELECTED
       C: N=B
       LOAD:$SELECT
*SCI1
       C: S=S+1
       R: TALLY NO. OF TIMES SCI IS SELECTED
       C: N=S
       LOAD:$SELECT
*HIS1
       C: H=H+1
       R: TALLY NO. OF TIMES HIS IS SELECTED
       C: N=H
       LOAD:$SELECT


*FIN
       E:
```

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Nevada Pilot

Continued from page 135

handles integer numbers);

- J: a jump command, similar to GOTO in BASIC except more options are allowed, i.e.,
- JY: jump on Yes flag, depends on last M (match) statement;
- J (cond): label, allows a jump only if (cond), conditional statement, is true to a label statement;
- A: accept input command, similar to INPUT in BASIC except a string name need not be called out;
- R: a remark line similar to a REM statement in BASIC.

A sample listing of a PILOT program is listed at the end of this article. It shows two program segments of a quiz game program.

Nevada Edit Screen Editor

The Nevada EDIT full screen editor worked well when used to perform sample editing sessions. No major problems were enountered in the use of the editor or its related reference manual. The editor is not needed for the above mentioned PILOT program, in that, an editor is built in and uses the same function keys for most of the basic edit functions as the NEVADA EDIT program. The only major complaint against the EDIT program is the inability to handle files larger than usable memory space in the RAM. No disc paging (as is done in WORDSTAR) is accomplished, thereby limiting file sizes to be edited to less than approximately 44K bytes (for a typical 64K byte system). This is a severe handicap when editing large assembly file (.ASM) source listings.

I was familiar with ED.COM, the editor available with all Digital Research CPM software. This was neither easy to master, nor use. A full screen editor such as NEVADA EDIT makes the routine chore of editing program listings, whether they be Pascal, Assembly code, or some other source code, a much simpler task.

The positive feature of NEVADA EDIT is the function keys for cursor movement, text insertion, and related functions are the same as WORDSTAR function keys in most instances. This makes the transition from one editor to another less tedious. The ability to reconfigure the keys is also allowed on the NEVADA EDIT disc, again a nice feature if you are not used to the WORDSTAR function key assignments, but to another editor with different function keys.

In conclusion, the NEVADA EDIT editor is useful for editing small source files of either a segmented Pascal or similar type program, in lieu of using ED.COM. For large files (greater than 44K bytes), another editor is recommended. ●

Heath/Zenith

Continued from page 126

you found it discussed in any computer articles? How about in computer books? Have you discussed it at your computer users' groups? It is discussed in the MS-DOS manual, but only to a limited extent.

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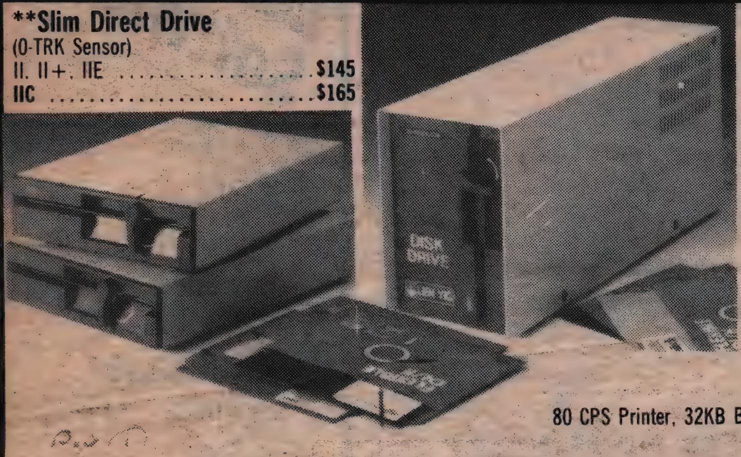
```
ENTER A DOS COMMAND==>
```

NOT impressed? Perhaps NOT! If that is all the PROMPT command could do, I would not waste the reader's time or my time writing about

Continued on page 138



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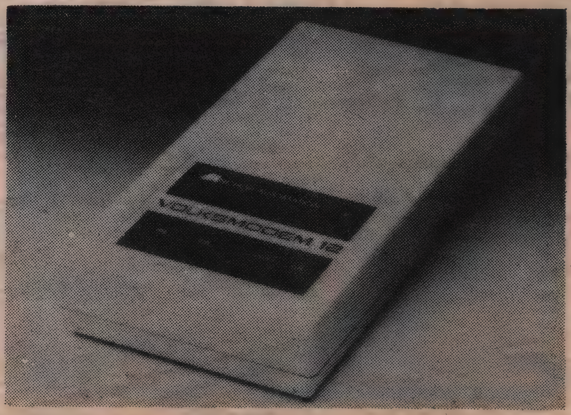

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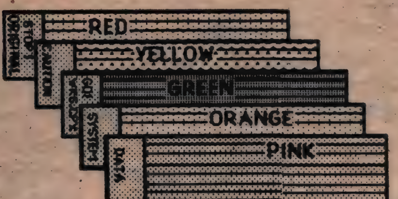

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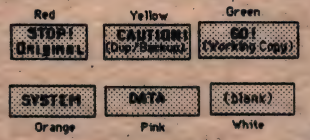

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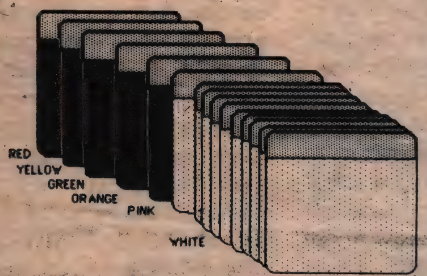

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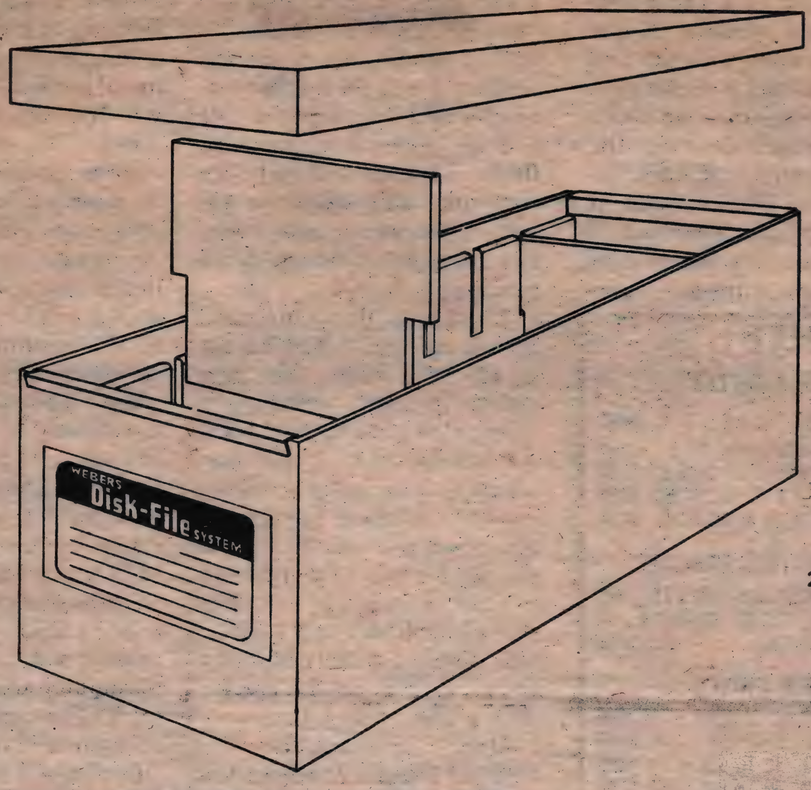

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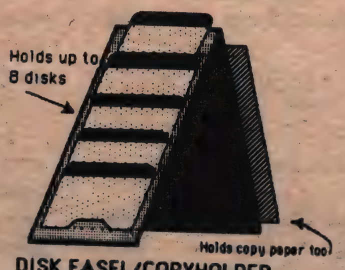

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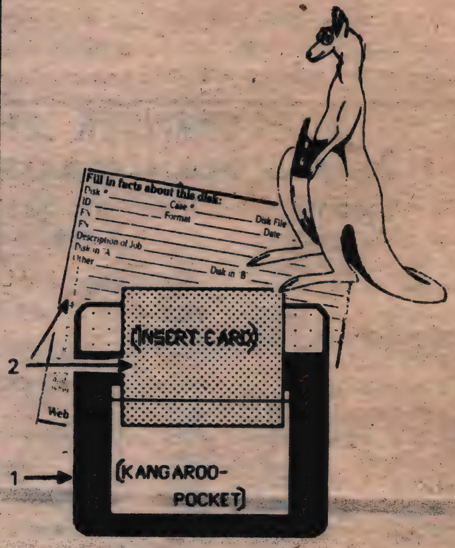

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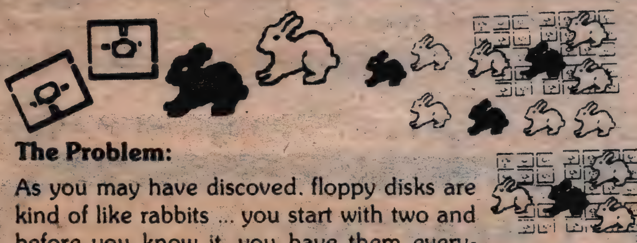

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Heath/Zenith

Continued from page 136

it. This command CAN do much more than provide a substitute for A> on the screen. It can do the following:

1 - Display the Time and Date.
2 - Display the current directory path (for tree-structured directories that I will discuss in a future article).
3 - Place this type prompt anyplace on the screen.
4 - Change the color/graphics display mode and colors (assuming a color monitor).
5 - Redefine the whole keyboard or any key.

The above is a partial list and all are possible if the reader is willing to study and try the PROMPT commands and the intricacies of MS-DOS.

As I stated above, the PROMPT command is described in the MS-DOS manual. It is a "Resident" command. I will assume that the readers know what that means - internal rather than an external command. The general format of the command follows:

```
PROMPT [$][prompt-text]
```

where "prompt-text" stands for a wide range of commands and "$" provides "meta-strings."

This should not scare the readers. I will get this into examples and language that we can all understand provided that the reader will go to the computer and TRY the examples as we discuss them. Learning is by doing, NOT reading!

Executing this command makes the text following the word PROMPT the new system prompt, until it is changed or until the next boot. (Remember this! If the user wants to keep using a custom prompt, it must be defined after each bootup. If this new prompt is going to be repeatedly used, it should be added to the AUTOEXEC.BAT file! I will discuss BATCH files in a future article for the readers that are not using them.)

Only one blank between PROMPT and the prompt-text will become part of the command, but any number of trailing blanks following the prompt-text (before pressing Return key) are included. The word PROMPT alone, with no following prompt-text, resets the system prompt to the default drive the way we are accustomed to.

How long can the prompt-text be? Normal MS-DOS command processing accepts strings up to 128 characters including the final Return. This allows us a prompt-text of 120 characters (128 minus 6 for the word PROMPT, 1 for the space after the word PROMPT, and 1 for the final Return.) It is possible to create a longer prompt if the command is a line in a BATCH file which will be used later in the article.

The prompt command becomes part of the command processor's environment. The environment memory (and hence any prompt that we create) can be viewed with the SET command if no parameters are included. (How many readers use the SET command? Would you like me to include this command in a future article?) If the user has executed any programs that remain in memory (such as MODE, PRINT, ASSIGN, etc.) the environment memory may be limited. Using a long prompt may prevent the use of a long pathname. These are all trade offs to think about. If this problem occurred, the message - OUT OF ENVIRONMENT SPACE - would be the result. I've encountered crashes without getting the message when attempting to set long prompts. However, I no longer have this problem because I have found it unnecessary to use either really long pathnames or long prompt-text. I just got carried away at the beginning. Do not forget this warning in case you would get into the problem. No damage is done except for losing whatever you have in RAM at the time.

Certain characters cannot be used directly in prompt-text. These characters are angle-brackets,"<" and ">"; the equal sign " = "" and the vertical bar ":". MS-DOS reserves these characters for other things, such as redirection of standard input and output (do you know about this?). The equal sign will work if it is not the first character of the prompt-text. Spaces, commas, semicolons, and the equal sign are all ignored when they are used as the first character of the prompt-text.

To use the above characters in prompt-text, "meta-strings" can be defined to take their place. These meta-strings consists of a dollar sign, "$", followed by a letter or symbol. The letter can be upper or lower case. A list of possible meta-strings follows (Note: This information applies to the H/Z-100-PC, IBM-PC, and IBM-PC Clones. I have not tried them with my H/Z-100. The H/Z-100 manual discusses the PROMPT command but the control codes are different:)

Now, an example! To use the right-angle ">", the meta-string $g would be the entry. Therefore, the following command:

```
PROMPT ENTER A DOS COMMAND--$g
```

would display the same prompt that I showed at the beginning of the article!

If the user wanted a prompt

Continued on page 140

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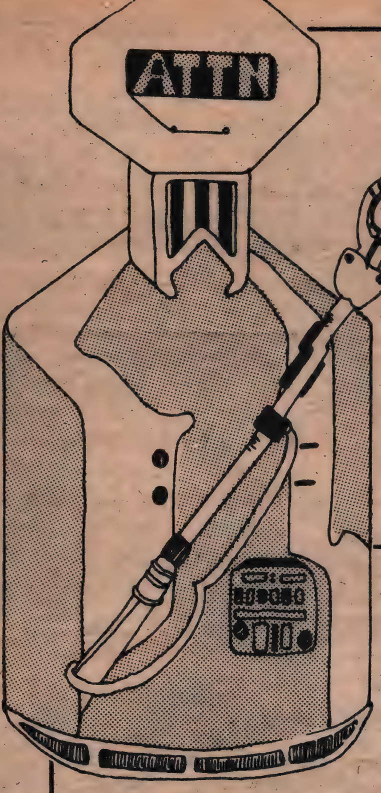

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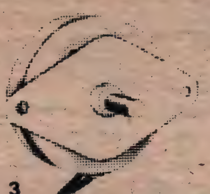
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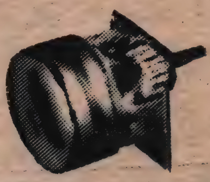
8

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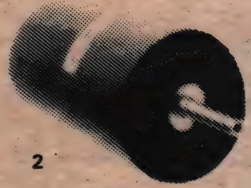
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1.8	1.8	150	PM 4 Ø	1) 2 3/16 L x 2 3/16 dia. 2) ⅜ dia. x 1 L	1	Superior Electric M091-FD-6009	34.50	59.50
1.8	1.8	72	PM 2 Ø	1) 2 3/16 L x 2 3/16 dia. 2) ¼ dia. x ¾ L	1	Superior Electric M061-FF-6201B	19.95	37.50
7.5	5	13	P M	1) 1 ½ L x 2⅛ dia. 2) 5/16 L x ¼ dia.	6	Airpax A82816	8.95	16.95
7.5	9	36	P M	1) 1 3/16 L x 2 ¾ dia. 2) ¼ dia. x ½ L	6	N.A. Phillips B82916	9.95	17.95
7.5	12	13	P M	1) 1 L x 2 ¼ dia. 2) ¼ dia. x ¾ L**	3	N.A. Phillips A82733M2-3	9.95	17.95
7.5	12	16	P M	1) 1.97 L x 1.39 W x .68 H 2) .375 x .125	4	Airpax K82201-P2	5.95	9.95
15	28		VR	1) 2) Size 15	7	Rapid Syn. 15R-01X	29.95	49.50
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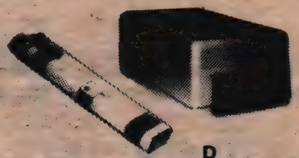
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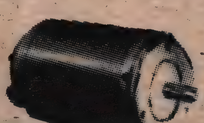
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Circle 2

Heath/Zenith

Continued from page 138

that begins with a blank space, comma, or semicolon, the user would start with a null character. Checking the above list, we find that null characters are created by combining the dollar sign with x (or any character not used in any other meta-string). Here is an example of a prompt that would begin with a blank and end with three blanks:

```
PROMPT $x   SYSTEM PROMPT   $x
```

Note, I used three spaces after the first $x and again before the second $x.

The second group of meta-strings in the above list provides us with a method of displaying current information about the current system. Thus, we have a means to show the current default drive (with its normal prompt), the current directory path (if using tree-structured directories), the current date, the current time, and the current MS-DOS version number. I do not know how many MS-DOS utilities the average reader knows how to use. If I use any that are unknown and if further explanation is needed, write to me and let me know which ones. If I am getting too basic, let me know about that too. I need to get to know the **Computer Shopper** reader better.

The current directory path is displayed by using the CHDIR (or CD) command without any parameters. The VER command will display the version number.

```
META-STRING     DEFINITION SPECIAL CHARACTERS
-----------     ------------------------------
    $g          ">" character
    $l          "<" character
    $b          "!" character
    $q          "=" character
    $$          "$" character

                SYSTEM INFORMATION
                ------------------
    $d          current date
    $t          current time
    $n          default drive letter(1 character)
    $p          current directory name default drv
    $v          MS-DOS Version Number
    $s          space(leading only)

                CURSOR CONTROL
                --------------
    $_          carriage return/linefeed(underline)
    $h          backspace/erase previous character

                OTHER ASCII CHARACTERS
                ----------------------
    $e          ASCII ESCape character
    $x          null string(x=any char not used)
```

Now an example with the PROMPT command follows:

```
PROMPT $p$g

will display the following:

A:\>
```

if drive A: is the current default drive and the user is in the root directory. If the user is not in the root directory, the directory path would be displayed as follows:

```
A:\LEVEL1\LEVEL2>
```

This is a good practical application of the PROMPT command. It provides a display with a constant visual reminder of the current directory path. The system must access the disk before displaying the directory-path prompt. This will cause a delay, depending on how deeply embedded the subdirectories are. If this default disk is a floppy diskette rather than a hard disk, this frequent disk usage could be annoying. Usually with diskettes the directory-path is simple.

Another meta-string will position the cursor as part of the PROMPT sequence. The cursor can be backspaced (with an erasure) or a carriage return/linefeed can put the cursor at the beginning of a new line. Checking the above list, we see that $h meta-string provides a backspace & erasure. Here is a possible application for this meta-string. I will combine the $h with the $t (time display) to eliminate the hundredths-of-seconds from the time display as follows:

```
PROMPT $t$h$h$h$g
```

This will produce the following display:

```
12:31:24>
```

Three additional $h's will erase the seconds as well and give the following:

```
12:31>
```

From the above list, we find that the meta-string $ (underline) is a carriage return/linefeed sequence. The defined prompt would be displayed up to the $, and then the cursor would be moved to the beginning of the next line where any meta-string after the $ would be displayed. How about an example:

```
PROMPT OK$ __
```

would display the prompt usually with BASIC - OK - and waits for the next input. This would not be a very useful prompt, because the user would be lead to believe that the system is in BASIC while still in DOS. Similar confusing prompts should be AVOIDED unless there is some special application in mind.

Looking at the above list, we have the $__ meta-string that displays the ASCII ESCape character (Hexidecimal 1B or Decimal 27). This meta-string opens up a whole new set of options using the PROMPT command, but the reader should know about the following:

1--ANSI.SYS
2--CONFIG.SYS

In this series of articles I will be discussing these two subjects some more. At this time I will concentrate on their usage with the PROMPT! (NOTE! Again, there is a difference between the H/Z-100 and the H/Z-100-PC (includes IBM-PC and Clones) because the H/Z-100 uses a file called ANSICON.DVD in place of ANSI.SYS which has different control sequences. Also, the use of the Z-319 video board could cause changes. I have not worked with the Z-319 board as of now.) ALL the applications in this article have been used on the H/Z-100-PC but not on the H/Z-100.

The ANSI.SYS file is discussed in the MS-DOS 2 Programmer's Package I discussed at the beginning of the article. This file includes a series of video control sequences that begin with the ESCape code. Since ANSI.SYS assists MS-DOS in driving the display, it functions as a DEVICE DRIVER! (DEVICE DRIVERS are covered in the MS-DOS manual and if the

Continued on page 144

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Remember Thee
Continued from page 116

trically Alterable ROM whose data can be read into the chip in a few milliseconds or so. Although this ROM is easy to program, erase, and reprogram, it is one of the slowest ROMs.

Other Memory Devices

There are non-semiconductor memory elements sometimes encountered in computers. These include the now-relegated to history "core" memory and the new magnetic "bubble" memory. This latter type of non-volatile memory can store quite a bit of data within a relatively small package. Unfortunately, bubble devices are slow to read and at the present somewhat expensive. Bubble devices may replace diskettes in the not-too-distant future.

Another semiconductor technique that seems to be making some headway is the CCD (charge-coupled device). The technique allows high density cell structures, with a payment of slow speed and expense. Most likely, we will not see CCD memory in the next few years.

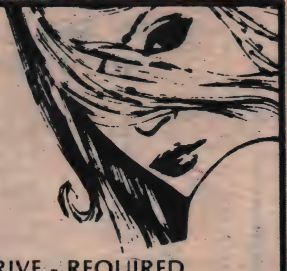
RAM/ROM. Since RAMs, especially CMOS types, require so little dc operating power in their standby mode to maintain their data integrity, it is possible to have battery-powered RAM where some type of rechargeable cell is used to maintain data in the RAM when the system power is turned off. Using a diode steering circuit, the battery is automatically placed on charge while the system is turned on, and when the dc operating power is removed, the backup battery automatically takes over. In this way, a volatile RAM can assume the storage characteristics of a non-volatile ROM.

Using this approach, data can be "permanently" stored in this RAM (as long as the battery is charged), and without examining the chips themselves, it becomes almost impossible to determine whether the data you are looking at resides in battery-powered RAM or ROM.

Since the cost of semiconductor memory is coming down in price, a new storage device using battery back up is coming into wide use.

This new device is a battery backed RAM board, that can be used to emulate a disk. Such an emulation works because when a computer goes to an I/O port, it is only looking for the correct handshaking and will then read or write digital data to that port. The CPU does not "know" if it is communicating with a conventional rotating diskette, or a battery-powered RAM.

Since a battery powered RAM system has a much faster access time than a disk, programs stored in the RAM run very much faster. Those of you that use (for example) WordStar — a word processor that gets its various overlays from a diskette — will appreciate the high speed of a RAM "diskette." ●



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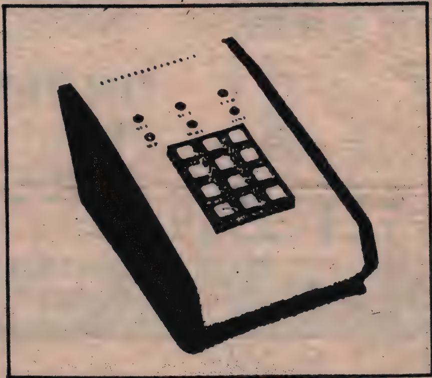

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7440	0.90	74173	0.85
7445	0.33	74174	0.90
7450	0.33	74175	0.90
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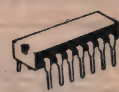

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1¼ x ¼ 250V

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MDL 2½	2½ AMP	.45	37.50
MDL 2	2 AMP	.45	37.50
MDL 1½	1½ AMP	.45	37.50
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MDL 5	5 AMP	.45	37.50
MDL 6	6 AMP	.45	37.50
MDL 7	7 AMP	.45	37.50
MDL 8	8 AMP	.45	37.50
MDL 10	10 AMP	.45	37.50

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1¼ x ¼ 250V

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GMA 2	2 AMP	10/1.50	100/9.50
GMA 2½	2½ AMP	10/1.50	100/9.50
GMA 3	3 AMP	10/1.50	100/9.50
GMA 4	4 AMP	10/1.50	100/9.50
GMA 5	5 AMP	10/1.50	100/9.50
GMA 6	6 AMP	10/1.50	100/9.50
GMA 7	7 AMP	10/1.50	100/9.50
GMA 8	8 AMP	10/1.50	100/9.50
GMA 10	10 AMP	10/1.50	100/9.50

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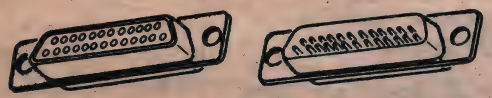

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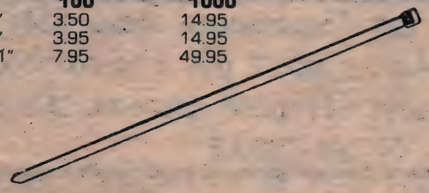

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Heath/Zenith

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reader is not conversant with them, I would suggest reading the material before proceeding. I will be writing more about device drivers in future articles. I would say that H/Z did a poor job of discussing both ANSI.SYS and Device Drivers, but hopefully, when we complete these articles they will be understandable. Using ANSI.SYS with the PROMPT command will be simpler than the documentation implies.

ANSI.SYS is loaded from a CONFIG.SYS file when MS-DOS is booted and it becomes part of the operating system at that time. Therefore, it does increase the memory requirements a small amount. Again, I do not know which readers know how to use the CONFIG.SYS file. It is described in the MS-DOS manual and I will be using it for other applications in future articles. So, please look it up in the manual and read about it. For now, I will cover what is needed for the PROMPT command application.

First, we must create the necessary CONFIG.SYS file if the user does not have one. One way to do this is with the COPY command. I am sure all readers know and use this command, but how many know how to create an ASCII text file with it?

If you already have a CONFIG.SYS file, add the DEVICE = ANSAI.SYS to your file. Reboot the system to load the ANSI.SYS file.

```
Type the following:  COPY CON: CONFIG.SYS
Press Return key;
Type the following:  DEVICE = ANSI.SYS
Press Return key;
Press F6 function key(or CTRL-Z for end-of-file);
Press Return key again.
```

For our PROMPT command options, the boot disk must have the CONFIG.SYS file with the ANSI.SYS file included. Now, the $__ meta-string provides a whole new set of extended screen control features. The ANSI.SYS file will interpret any command string that begins with the ASCII ESCape character and either position the cursor, move it around, set display attributes and colors, or redefine the keyboard. That is a LOT of power! I will list some of the mots useful of the screen control sequences below. There are more of them listed in the MS-DOS Programmer's Package.

CONTROL STRING	DEFINITION
`$e[s`	SCP(save current cursor position for a future RCP procedure)
`$e[u`	RCP(restore cursor position from a previous SCP sequence)
`$e[n;nH`	CUP(cursor position--sets cursor to the row and column substituted for the first & second n respectively)
`$e[nA`	CUU(move cursor up n positions)
`$e[nB`	CUD(move cursor down n positions)
`$e[nC`	CUF(move cursor forward n positions)
`$e[nD`	CUB(move cursor back n positions)
`$e[2J`	ED(erases whole display & homes cursor to upper-right corner)
`$e[K`	EL(erases from cursor to end of line)
`$e[s;...sm`	SGR(set graphic rendition--see Programmer's manual as info is beyond what I can include here--if there is interest I will write an article on it. The s is a selective parameter)
`$e[7m`	SGR(turns on reverse video)
`$e[0m`	SGR(turn off all attributes)
`$e[0;n;"s";13p`	Reassign Extended ASCII keyboard KEY n to the command string "s" followed by a carriage return, 13.(refer to Programmer's manual for info--I do not have article space in this article. This is the basis for a software package called "PROKEY". I will write an article on the subject.)

NOTICE! In the above list, some characters are uppercase and some are lowercase. This is an IMPORTANT distinction. ANSI.SYS interprets the cases differently. Let's try a fairly simple example:

```
PROMPT $e[s$e[0;0H$t$e[K$e[u$n$g
```

That command line may not look very simple to the reader! Every $__ meta-string is converted to an ASCII ESCape code when the prompt is displayed, and therefore informs the ANSI.SYS file that a control sequence is present. I will go through the command step-by-step.

The $__[s ANSI.SYS string, from the list above, saves the current cursor position so that it can be put back where it belomgs after we finish moving the cursor around on the screen. Next, $__[O;OH, refer to the list, move the cursor to the position of row O and column O on the screen's upper-left corner. And, $t meta-string displays the time if you check the list, while $__[K erases the rest of the top line (if there is anything there). The $__[u, if user looks at the list, will restore the cursor to its previous position. Finally, ng will display the normal default drive prompt. Wasn't that EASY? Try some command lines of your own. This is the way to learn.

When DOS tries to display the prompt, the $__ meta-string will first send an ESCape character to the screen. ANSI.SYS recognizes that this is a

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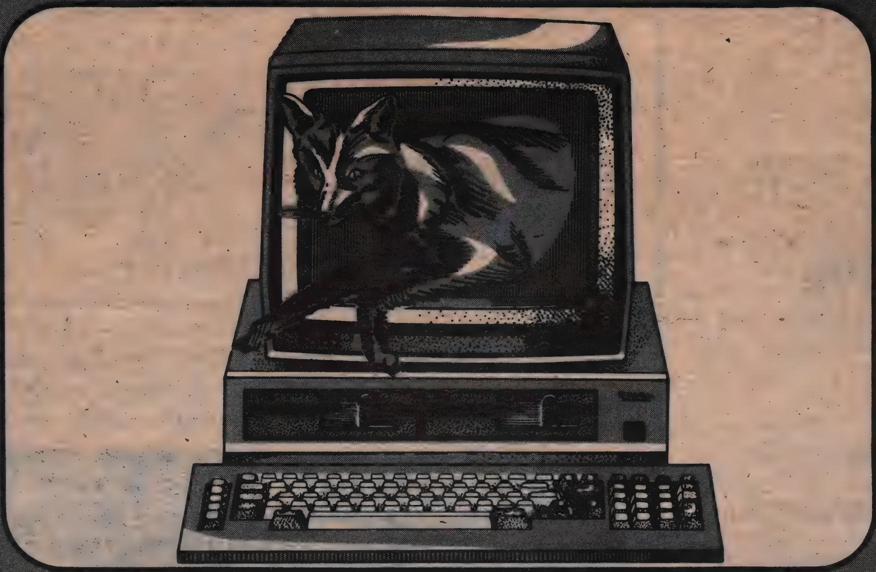

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start of an ESCape code, so interprets the character that follows and carries out the intercepted command. The TIME display, in the corner of the screen, will only be updated when the DOS displays the next prompt with the TIME included. In other words, it simply indicates the time when DO last displayed the prompt. A clock board will NOT update the time display continuously. This might be an advantage or not depending on why it is being used.

A warning might be in order at this point. If you did not get the desired display, but found some arrows displayed on the screen' THEN the ANSI.SYS file probably was not loaded. One way to check, use the CHKDSK command to display the amount of available RAM, since ANSI.SYS is a "load-and-stay" resident module you should see the difference. Also, use the TYPE CONFIG.SYS and Press Return Key to display the text file on the screen. Did you find-- DEVICE = ANSI.SYS?

What would be a practical application for such a prompt? A time and date prompt could be used to find the files that should be backed up for that period if a hard disk is being used. The command will create a primitive status line at the top of the screen with TIME displayed. These status lines are easy to create and customize with the PROMPT command. If the status line is placed at the top of the screen, rather than at the bottom, when the screen scrolls the previous status line will roll off the top for possible replacement with another. I would like the readers to think about creating a status line on the 25th line of the screen. Can you see how to do this? Is there an application here? User friendly instructions might be presented. This is a reader experiment to try!

How about another example? Here is a prompt that will display most of the available system status on the top four lines of the screen:

```
PROMPT $e[s$[0;0H$v$e[K
$_DIRECTORY:$p$e[K
$_DATE:     $d$e[K
$_TIME:     $t$e[K$e[u$n$g
```

Now, let's analyze these command lines step-by-step. Please refer to the previous lists above. The $e[s saves the current cursor position so that we can restore it after our status lines are completed. The $e[0;0H portion sets the cursor to row 0 and column 0 (we know that this is the upper-left corner). The $v meta-string displays the version number of MS-DOS and the $e[K sequence erases the rest of the first line if anything is there. (I have found it safer and easy to include this erasure.) The next three lines all begin with the $__ meta-string carriage return/linefeed so that their displays will be on a line of their own. I show spaces after the DATE: and TIME:, so that the information will line up nicely on the screen. AND,

Continued on page 147

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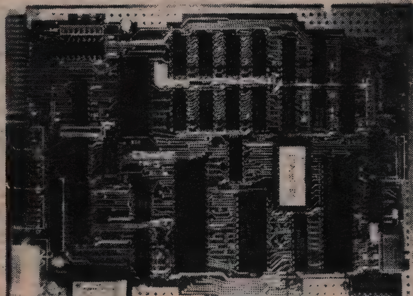

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remember that the $e[K portion is there to erase the rest of the line if needed. The cursor is restored from the initial save sequence with the $e[u sequence. Finally, the meta-strings ng puts the familiar right-angle bracket for the default drive back on the screen. Did you notice that I did not say anything about the $p, $d, and $t meta-strings? I left them out for the moment and hoped that the reader would look at them, think about them, and check the above list to see what they do! Did you do this?

I think that this is a good place in the article to warn the readers that if they want to learn new things that can be done with their computer they MUST TRY them with their computers! Also, try some variations. NO harm can be done and there is everything to gain. Who knows when a valuable need might occur for one of these examples or for one that you think up!

I hope that the readers are asking themselves a question by now! Should NOT the PROMPT sequence be entered on a single line? I showed the commands on separate lines for CLARITY, but in REALITY all PROMPT sequences MUST be entered on a SINGLE line. There is a way around this, but I will get to it a little further along in the article. Watch for it.

How about using reverse video or color or some other attribute to make this status line stand out? Refer to the manual and/or above lists for some control sequence to use. The $e[7m control string will turn on the reverse video. Anything following will be displayed in reverse video until it is turned off. Do NOT forget this! The $e[0m sequence will restore normal video. From the manual we find that $e[5m control string will cause the displayed characters to blink. If using a color monitor, similar control strings can be used to change the foreground and background colors. This gives me an idea for practical application to think about. If using some program like a compiler, that takes some time to do its processing, how about using a reverse video and blinking display of a "WAIT" message in the upper-right corner of the screen? Will the reader try this?

Here is another idea to try. Leave the version number off the status line and display the current directory, date, and time all on one top of screen status line in reverse video. Remember the maximum number of characters is 63, so the directory path should be 10 characters less than 63.

Here is a prompt that I use often. It puts the date and time in the upper-right corner of the screen in reverse video and replaces the normal system prompt with the directory path:

```
PROMPT $e[s$e[1;51H;$e[K$e[7m$d/$t$e[0m$e[u$p$g
```

Remember to enter it on one line. I will let the reader analyze this command line step-by-step. Do this first, to see what will be displayed and where. THEN TRY IT!

If a prompt is found, that is used regular, put it in a AUTOEXEC.BAT file. This will cause the prompt to be set everytime that the system is booted. This can be done a couple of ways. First, put the prompt command directly in the AUTOEXEC.BAT file. Second way, put the prompt command in a batch file (I call mine PMPTSTAT.BAT) and then put this batch filename into the AUTOEXEC.BAT file.

I know that some readers may not be well versed about directory paths and batch files. As I stated at the beginning of the article, I want each article to have something for every reader. Advanced readers will already know about directory paths and batch files while other readers that are just beginning to use MS-DOS will not. Therefore, I will write about these in a following article along with some more advanced ideas. I hope that the readers will go along with this. If any readers have strong feelings one way or the other I would like to hear what suggestions they might have. I want to please the majority!

Before I start the next discussion subject on PROMPTS, I want to remind the readers about two basic things when

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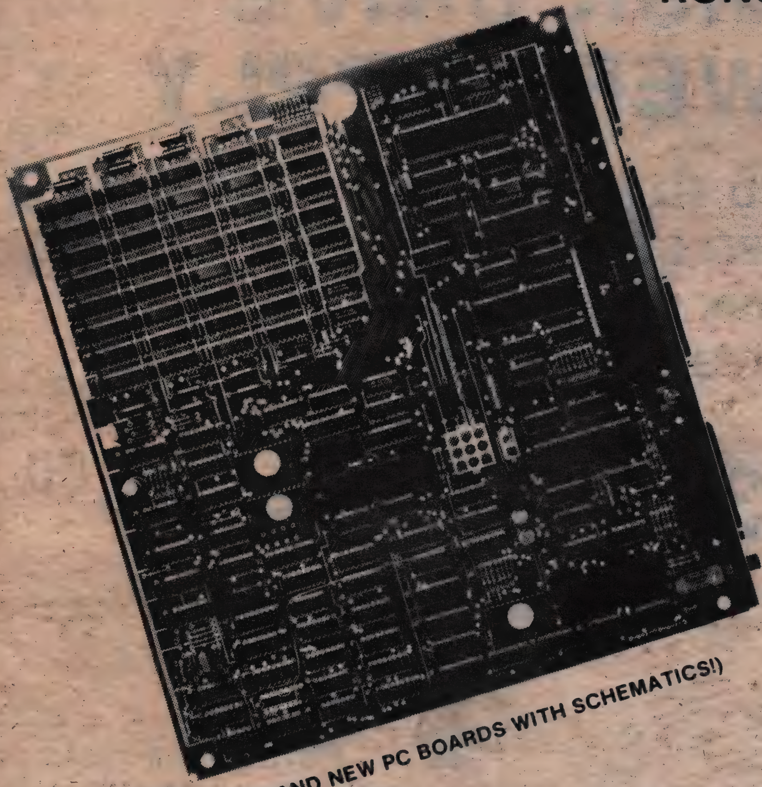
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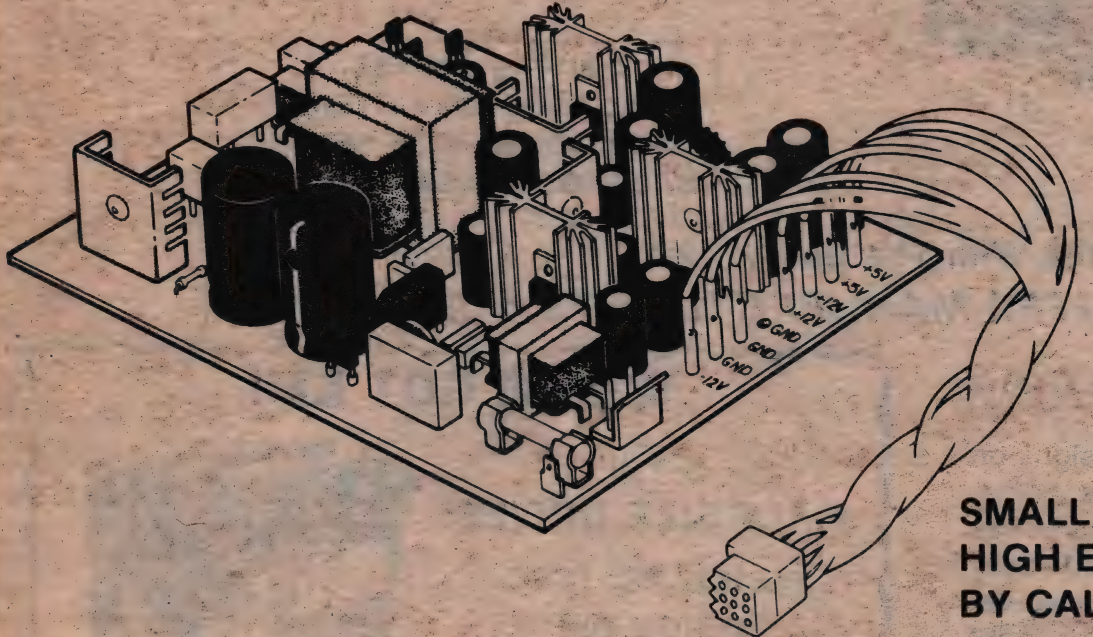

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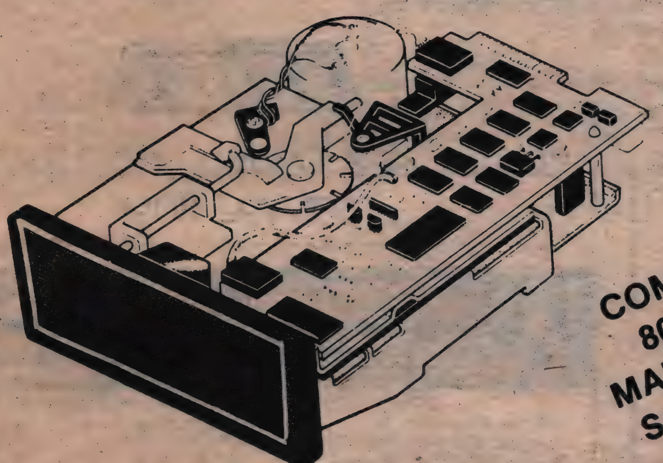

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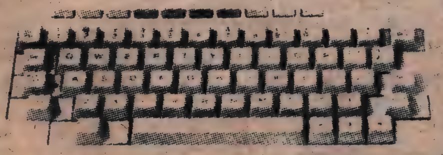

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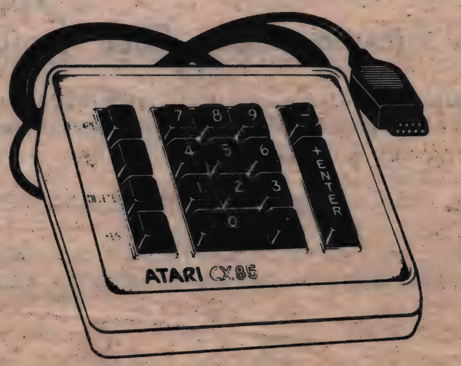

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Heath/Zenith
Continued from page 147

working with PROMPT commands:

```
$e[key;definitionp
```

1--PROMPT commands ARE NOT stored on disk. PROMPT must be entered every time the system is booted and this is why I have discussed batch files.

2--CONFIG.SYS file MUST contain the ANSI.SYS file and they must be on the default drive. They ARE stored on disk and they automatically load every time the system is booted.

Next, I will discuss Keyboard Reassignment as we will use it with the PROMPT command. Keyboard Reassignment has other uses that I will discuss in a future article. The reader may have seen them used with Macros. The Programmer's Package has a short dissertation on the subject, but falls way short of an adequate explanation in my mind. I will expand on the subject. ●

Continued Next Month

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**Languages and Versions
Continued from page 63**

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Continued on page 156

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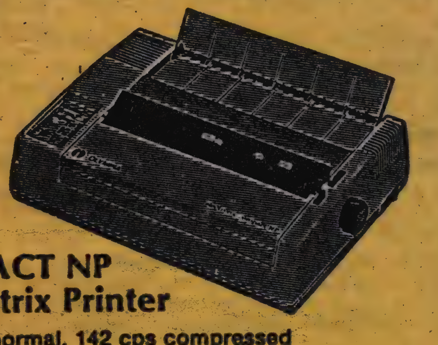

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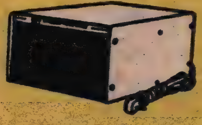

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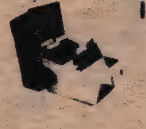

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Languages and Versions
Continued from page 153

the trademark. JANUS/Ada, an implementation of Ada developed specifically for microcomputers, is available for the 55X from A-OK Computers. The JANUS/Ada Manual is $35, the compiler package is $99.

Other Languages

It is just a matter of time until various computer languages - FORTRAN, Pascal, Logo, and others - make their appearance for the 55X. For example, an article by John D. Unger in the February, 1985 Soft Sector discusses compilers and the C language.

Disk Operating System Versions

Even though the Sanyo 55X is still in its infancy, several versions of the Sanyo MS-DOS's (Microsoft Disk Operating Systems) have made their appearance. Feature-by-feature comparisons are tedious and too technical, but here are some of the advantages or disadvantages of several DOS versions.

Sanyo MS-DOS 1.25

I used MS-DOS 1.25 almost exclusively for a year with my MBC 550, and have only a few complaints. Control-S was not implemented to interrupt screen displays. A program called "P-S", which allows you to direct printer output to the serial port, will not run with 1.25 unless the BIOS is modified. (P-S might be available, with the modified MS-DOS, from your Sanyo dealer.) There is no provision for transferring disk files to another disk with the 550, since the COPY command works only with a two-disk system.

Information on the majority of MS-DOS 1.25 commands is either brief or non-existent in the manual supplied with the Sanyo, but I found that several generic MS-DOS books on the market filled in the gaps. Actually, I do as little as possible with DOS, just using it for disk and file copying, and to get into BASIC - so I'm not a discriminating user. (FB)

Sanyo MS-DOS 2.11

Sanyo MS-DOS 2.11 supports MS-DOS 1.25 commands, plus a number of additional ones. It handles both single and double-sided drives, providing up to 360K storage on one disk when formatted on both sides. MS-DOS 2.11 supports either single or double-sided drives in 8 or 9 sector-per-track formats. It cannot be used with an MBC 550 since it requires at least one double-sided drive to load into the computer (unless you get someone to make you a single-sided version.)(FB)

MichTron's DOS Versions

MichTron (576 S. Telegraph, Pontiac, MI, 48054, (313)-334-5700) has two different DOS versions. They were among the first to offer a double-sided DOS 1.25 version, which they now call DS-DOS Plus 1.25. It is far more versatile than Sanyo's MS-DOS 2.11, and sells for $29.95. An even more sophisticated version, DS-DOS Plus 2.11, sells for $49.95. Send for MichTron's free catalog, which details the features of each

Continued on page 158

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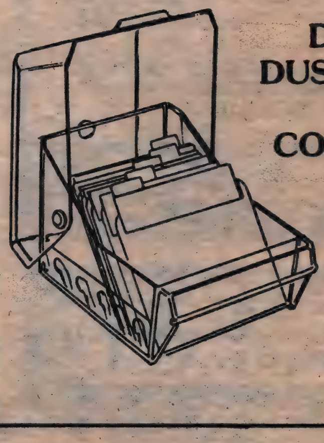

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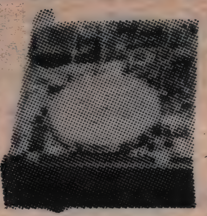

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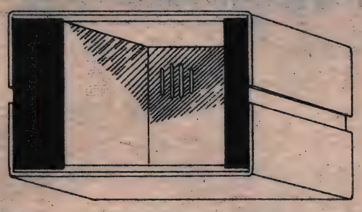

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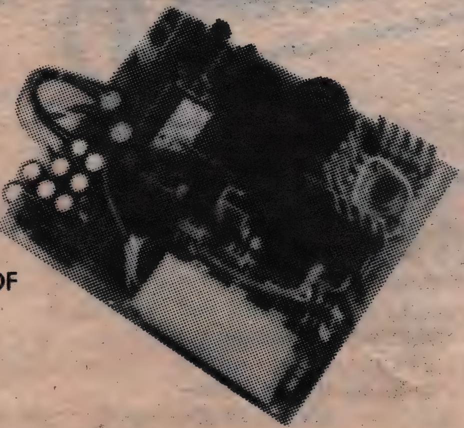

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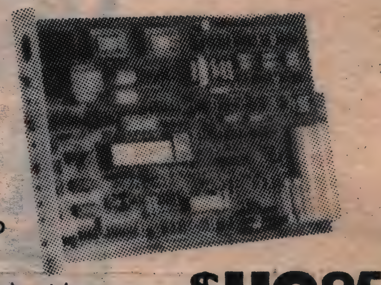

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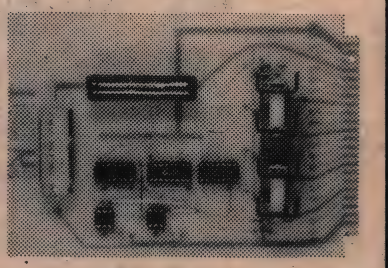

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Languages and Versions

Continued from page 156

DOS - and describes their many Sanyo programs.

The MichTron DOSs format a disk either single or double-sided, with either 8, 9, or 10 sectors per track, yielding up to 800K per disk on an 80-track drive.

I've found MichTron's DOSs, written by Sanyo wiz Tim Purves, easy to use, and have abandoned my Sanyo DOS.(FB)

A-OK DOS Family

A-OK (address earlier) offers four DOSs, each available in either the 1.25 or 2.11 version. I used their original A-OK DOS extensively during the writing of my Sanyo book, since some of its features were life-savers compared to Sanyo's MS-DOS 1.25. (Note: A-OK DOS was discussed in April's issue of Computer Shopper on the Silver Fox.)

A-OK DOS-1, for $35, will handle any combination of up to four single and double-sided drives with 8 and 9-sector formats. A-OK DOS-2, for $45, adds 10-sector formats.

If you get into quad-density disk drives, A-OK DOS-3, for $55, will do all that A-OK DOS-2 does, but with up to four double-density or quad-density drives, giving you up to 800K of storage on a single diskette! A-OK DOS-4, also $55, is like DOS-3, but for quad-density drives only. With four quad-density drives at 800K per diskette you can have 3.2 megabytes of removable storage on line! That ought to let you balance your checkbook...

Two particular features, not available on the original Sanyo DOSs (but perhaps implemented on later versions) are a built-in ASCII screen dump and the implementation of a screen-freeze function.

The ASCII screen dump will route a screenful of text to your printer with a SHIFT-CONTROL-A key combination. This was enormously helpful in getting printed screen RUNS for my Sanyo book.

By using the SHIFT-CONTROL-S keys together, the screen will "freeze" until another key is pressed. This is, in effect, the CONTROL-S function left out of Sanyo's MS-DOS 1.25. You no longer have to BREAK the program to keep information from scrolling up off the screen. Furthermore, this screen-freeze function is usable in MS-DOS as well as BASIC. When you display an ASCII program or ASCII text to the screen with the MS-DOS TYPE command, now you can stop the display when you please.

All A-OK DOSs include TurboDrive550, a RAM disk program, described further on. (FB)

M-DISK - The $34.95 Disk Drive

Although not a disk operating system itself, M-DISK, sold by MichTron for $34.95, is used by the DOS to simulate another disk drive.

M-DISK allows any Sanyo 550 series computer with 256K of RAM memory, either single or dual-drive, to act as if it had an additional drive. Part of RAM is set up as a software duplicate of a hardware drive. DOS then treats this section of RAM as a "phantom drive" or "RAM-disk."

With a single-drive 550, the RAM-disk is addressed as Drive B. With a dual-drive 555, this imaginary drive becomes Drive C.

When M-DISK is used with WordStar, all help and menu screens appear immediately, without time lost reading them from a hardware disk, and both regular drives can be used for other purposes. For example, by placing the working text disk in M-DISK Drive B, and using a spell-checking program in actual Drive A, you can access WordStar, the spelling checker and the working text without swapping disks - and the whole operation is immediate!

M-Disk also works with the Easy Writer I program bundled with the Sanyo 55X. M-DISK is an excellent program that works smoothly and in the blink of an eye. It is extremely easy to set up and use. It is particularly beneficial with programs that frequently access a regular disk drive, such as WordStar or DataStar.

Is it worth $34.95? Even at twice that price, it would still only be about half the price of an additional mechanical drive, and M-DISK works instantly. (FC)

TurboDrive550

Not to be outdone by MichTron's M-DISK, A-OK offers a RAM-disk program, TurboDrive550, for $33 by itself, for $7 as an upgrade for current A-OK DOS owners, or included free with the newer A-OK DOSs. It only requires a 128K RAM, but otherwise performs the same function as M-DISK.

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An Interview With Nigel Searle, Sinclair Research

by Fred Blechman

On January 1, 1985, I conducted a 45-minute telephone interview with Nigel Searle, Managing Director of Sinclair Research, Ltd., of the United Kingdom.

Sinclair has sold over three million microcomputers, starting with the ZX80 in 1980, followed by the ZX81 and the immensely successful Spectrum. In 1984 the Sinclair QL was launched, and it is the QL that is the major focus of this interview.

The following are excerpts of the interview, condensed and rearranged for clarity.

Q: How is the QL doing in England?

A: Very well!! We shipped 50,000 units in 1984, starting in April. Although that's below what we expected when we announced the QL, that really has more to do with the Spectrum than the QL. We thought the Spectrum had passed its peak, and we'd be devoting more of our resources to the QL. In fact, just the opposite has been true. We shipped over 200,000 Spectrums in three weeks in December alone!

Q: 200,000 Spectrums in three weeks? How many Spectrums have you sold altogether?

A: Over 2 million, worldwide. Anyhow, the continuing success of the Spectrum has been responsible, more than anything, for the slow development of the QL.

Q: What is your primary audience in England for the QL?

A: They're experimenters, they're hobbyists, they're people who now want not just a computer to play with, but a computer that's got real utility. They want something pretty powerful, but they want it at a price they can afford. They're probably also slightly the pioneering sort of people that don't want to buy a product that's been around for a few years. They'd rather buy tomorrow's product today.

Q: Are you aiming at the business market?

A: Not at all. That's a word we don't use ... except in the sense that the person running a sole proprietorship business from home or a small shop could use the QL. However, we are not aiming at the IBM PC market - not even the PCjr market. I honestly don't believe that there's a great deal of direct competition between the two in the sense that the sort of people buying a PCjr are buying it for the name and the security. They're very conservative

Continued on page 160

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Interview With Nigel Searle

Continued from page 159

purchasers who want a large software base and would never dare take the "risk" that's involved in something like the QL. And yet the people who buy the QL wouldn't be seen dead with a PCjr!

Q: You originally started selling the QL in England strictly mail order. Are you into the stores yet?

A: Yes. The QL has been available in certain stores, such as W.H. Smith, Boots and Dixons, since early October. These are not exactly like department stores in the U.S., but they are mass retailers and have developed large low-cost computer businesses.

Q: Do you sell mail order anymore?

A: We don't sell mail order in England anymore. Once we go into retail distribution we stop mail order. Our dealers like the fact that we introduce the product by mail order because almost inevitably with a brand new product the demand outstrips the supply. Mail order ads make people aware of the product, and when it does go into the retail stores people don't have to be educated about the existence of the product.

Q: How many QL books are you aware of in England?

A: About 50. Five-zero. On the QL specifically. The interesting thing about the QL is that although in terms of its sales performance in 1984, which was somewhat slower than hoped - because of Sinclair's marketing resources and priorities rather than the machine itself - the support of the product has been absolutely phenomenal. I'm sure you're aware of how much software there is for the Spectrum, and how many books and magazines and so forth. I think that a lot of the people in and around these industries see the QL as virgin territory. They made money on the Spectrum. This time they're gonna jump in there first with the QL. The software that has begun to be developed is also quite impressive. The heavy foundation work has been laid in assemblers, compilers and so on and so forth....

Q: What kind of third party peripherals and software are available in England for the QL?

A: I've got a magazine in front of me called QL User, a 64-page bimonthly publication. Looking at some of the advertisements as I run through it, there's a four-page ad for an RGB color monitor modified specifically for the QL. There are memory expansion boards in every size from 64K up to half-megabyte. There are single and dual disk drives with up to 800K capacity available, as well as a 7.5 megabyte Winchester drive. These just plug into the QL. Here's an ad for a CP/M 68K. There's a Centronics parallel interface and an IEEE-488 interface. There's the usual variety of carrying cases and so on. Just looking through here at some of the books, there's QL Advanced User Guide, QL Games Compendium, QL Advanced Programming and on and on and on. There's a company here selling an assembler, a Forth interpreter, a Pascal compiler - and quite a lot of accounting programs for some reason.

Q: If a U.S. QL owner buys some of these devices and programs from England before they are available here, will they work properly with the U.S. version of the QL?

A: In most cases they will. I see no reason why they shouldn't, functionally. However, the connectors for the serial and joystick ports are changing for the U.S. units, so some hardware may require the use of plug adapters.

Q: Do you anticipate FCC approval shortly?

A: We have supplied the FCC with a U.S. production unit, and it appears only minor changes will be required. Unlike the Spectrum, which was never designed with an eye on the FCC, the QL has been designed from the beginning anticipating FCC qualification. By the way, have you seen the chess program?

Q: No, I haven't. What are you referring to?

A: There's a QL Chess program that recently was joint winner of the World Microcomputer Chess Championship. It displays a full 3-D perspective view of the chess board, and you naturally play half-that, moving the pieces with a one-pixel scroll so they just appear to glide across the screen. There are also a number of new communication devices that have come out in England, like an autodial modem, but these will require modification for U.S. use, since telephone communication standards differ.

Q: What peripherals are planned by Sinclair for the U.S. market? Do you have disk drives coming up?

Continued on page 161

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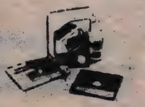

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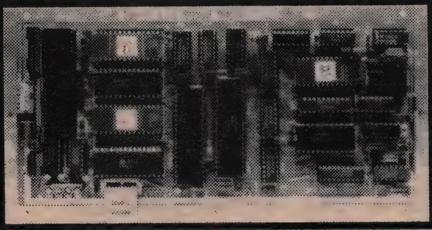

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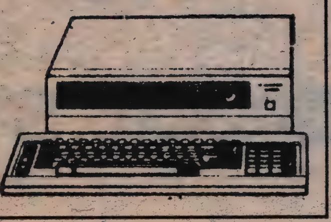

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Interview With Nigel Searle
Continued from page 160

A: Nope. However, as I've mentioned, these are available in England from third-party vendors, and I think we can assume they will be made available to U.S. users - perhaps distributed by Sinclair, even if we don't manufacture them.

Q: An RGB monitor for the QL?

A: Yes. Probably by Taxan - a modified Model 420.

Q: Extra Microdrives?

A: Yes. They are already available in England for the Spectrum, and the same Microdrives will operate on the QL, though they plug in backwards and upside down unless you use an adapter cable. QL Microdrives have the connector on the opposite side, and will be available in the U.S. The cartridge format is different, however, so Spectrum cartridges cannot be read by a QL Microdrive.

Q: Do you make a modem yet?

A: No, we don't. I haven't looked into the situation in the states. Our objective at Sinclair has always been not to try and do everything, but to do those things that are essential to support the machine, and which nobody else is gonna' do.

Q: Like the Microdrives, which are an exclusive device?

A: Right. For example, we had announced that we would sell add-on memory boards for the QL. Before we could move on the thing there were at least two companies selling them at very, very low profit margins where, frankly, it doesn't make sense for us to compete. We're actually cooperating with some of those people and agreeing to supply them with the standard black case that we designed for the expansion memory.

Q: Do you have a "Super-QL" coming up - say, with a 3-½ inch disk drive in place of the two Microdrives?

A: That had always been considered as an option. Although we have failed to prove this yet, our view is that people would rather have two Microdrives than one 3-½ inch floppy. I just do not believe that the problems of making backup copies and security and wanting to keep data files separate from applications programs and so on - I just do not believe that a single drive is an acceptable solution. Our observation of people who've bought single-drive machines, like Macintoshes, is that the first thing that they do is go and buy another drive. This is at least the 999th time I've been asked this question. I don't mean to be arrogant about it and say, "Look. Microdrives are vastly superior to 3-½ inch floppies!", or whatever. The point is that everybody and his brother is going to be building machines with 128K and 256K of memory, with a single drive built in. That's what the (Commodore) Amiga machine is about, that's what Jack (Tramiel, Atari) will do - everybody's going to be doing it. Sinclair's forte has always been to not follow the crowd, and to go off in the direction where it will not be followed itself, so that the market we have - although it may not be the mainstream market - is a very good one, and we have it pretty much all to ourselves. We believe that there are a lot of people out there who will accept the trade-off of price, compactness, et cetera, and convenience of two Microdrives, rather than have a single 3-½ inch floppy. If they want that, I think they'll go and buy it from IBM, Apple, Atari or others. We may be wrong, but if we win, we'll win big, and if we followed the other guy, the most that we can hope for is a tiny slice of pie. I can only say that Sinclair's objective has always been to be different - not just for the sake of being different, but we really do believe it's a good marketing strategy. Maybe at the end of the day we'll be proved totally wrong with no market acceptance and we'll have to go away and rethink it all and come back and compete with a 3-½ inch drive against everybody else - or decide that's not worth doing and do something totally different.

Q: Are there any other items Sinclair will provide for the QL in the U.S.A.?

A: We will make sure that certain key items are available, and I wouldn't rule out the possibility of Sinclair itself bringing over some third-party products from England and acting as a distributor, not putting Sinclair's name on them, but just to make sure that those products are directly available to American customers.

Q: The QL can support a 16K ROM cartridge. I suppose these are popular in England for games and such. Will Sinclair be providing those?

A: ROM cartridges are not at all popular in England. That's partly because the European market has never gone for ROM cartridges; it's all stayed on audio cassette, believe it or not. The problem is that the prices for cassettes are so low that anybody trying to come out with ROM cartridge software is at a huge price disadvantage. The ROM port on the QL will most likely be used for plug-in languages. To the best of my knowledge there are no ROM cartridges available at this time.

Q: Is Sinclair developing a communication program for the QL?

A: Not directly. There's a company in Britain who is developing a terminal emulation package and we may get involved in marketing that under our own name.

Continued on page 170

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Total Infomaster *C-64*	34.97
Total Time Manager *C-64*	27.50
VISICORP	
Visidex *Apple*	65.00
Visifile *Apple*	85.00
Visifile IBM XT *IBM*	99.00
Vision Application Manager *IBM*	65.00

Data Base Utility

APPLIED SOFTWARE TECHNOLOGY	
Cash Receipts Journal	*Apple* 28.76 *IBM* 28.00
Check Writer	*Apple* 28.00 *IBM* 28.00
Expense Journal/Distribution	*Apple* 28.00 *IBM* 28.00
Legal Office Manager Templates	*Apple* 260.00 *IBM* 167.00
Mailing List	*Apple* 28.00 *IBM* 28.00
Pascal Interface	*Apple* 165.00 *IBM* 163.00
Purchase Order Templates	*Apple* 34.97 *IBM* 34.97
BATTERIES INCLUDED	
Spell Pack *C-64*	34.97
FOX & GELLER	
D Graph	*Apple* 195.00 *IBM* 195.00
D Utility	*Apple* 65.00 *IBM* 65.00
Grafox *IBM*	195.00
Oz *IBM*	325.00
Quick Code	*Apple* 195.00 *IBM* 195.00
R Graph *IBM*	195.00
FUNK	
Sideways	*Apple* 40.00 *IBM* 40.00
KOALA	
Speed Key *IBM*	65.00
Speed Key Tablet w/Software *IBM*	129.97
MICROPRO	
Calcstar	*Apple* 125.00 *IBM* 125.00
Report Star	*Apple* 235.00 *IBM* 235.00
Supersort II *IBM*	130.00
MICRORIM	
Clout *IBM*	125.00
Extended Report Writer *IBM*	100.00
Programming Interface *IBM*	375.00
MICROSOFT	
M-Sort *IBM*	125.00
M-Sort 80 Program *Apple*	125.00

DATA BASE UTILITY CONT.

SENSIBLE SOFTWARE	
Report Card *Apple*	40.00
SIERRA ON-LINE	
HomeWord Speller *Apple*	34.97
SOFTWARE PUBLISHING	
School and Record Keeper IIe and IIc *Apple*	100.00
STONEWARE PRODUCTS	
D.B. Master Statistics Pack *Apple*	89.00
D.B. Master Utility Pack #1 *Apple*	89.00
D.B. Master Utility Pack #2 *Apple*	89.00
SURGE PROTECTORS	
Networx 4 Plug w/Cord	41.97
Brooks 4 Plug w/Cord 5 Year Warr	53.97
Brooks 6 Plug w/Cord 5 Year Warr	59.97
Isobar 2 Plug w/Cord	35.97
Isobar 4 Plug w/Cord	53.97
Powerguard 6 Plug Wall	17.97
Multiple Outlet 6 Plug w/Cord	11.97
Powermate Stopper 6 Plug w/Cord	35.97
Cord Reel 6 Plug 25 Ft Extension	20.97

Financial Modeling/ Planning

BLUE SKY SOFTWARE	
Calc Results Advanced *C-64*	66.50
Calc Results Easy *C-64*	34.97
BUSINESS SOFTWARE	
Plan Fin *IBM*	130.00
Pro Fin *IBM*	195.00
Pro Fin Plan Fin Display Program *IBM*	625.00
CREATIVE SOFTWARE	
Creative Calc	*IBM* 34.97 *C-64* 34.97
DOW JONES	
Investment Evaluator *IBM*	99.00
Investors Workshop *Apple*	99.00
Market Analyzer	*Apple* 230.00 *IBM* 230.00
Market Manager	*Apple* 199.00 *IBM* 199.00
Market Microscope	*Apple* 230.00 *IBM* 230.00
Spreadsheet Link	*Apple* 169.00 *IBM* 169.99
HES	
Finance Manager	*Apple* 66.50 *IBM* 92.50
Multiplan *C-64*	13.97
Omni Writer Spell Multiplan *C-64*	41.97
IUS	
Easy Planner *IBM*	175.00
MECA	
Managing Your Money	*Apple* 139.97 *IBM* 139.97
MICROSOFT	
Macintosh Multiplan *Apple*	136.50
Multiplan	*Apple* 136.50 *IBM* 136.50
MULTIMATE INTERNATIONAL	
Multimate *IBM*	299.00
PEACHTREE	
Peachtext 5000 *IBM*	265.00
PRACTICORP	
PractiCalc *C-64*	38.47
Practicalc II *Apple*	48.97
Practicalc III *IBM*	69.97
PS (Programmable Spreadsheet)	*C-64* 55.97
SCARBOROUGH	
Networth	*Apple* 55.97 *IBM* 69.97 *C-64* 55.97
SORCIM	
SuperCalc	*Apple* 136.50 *IBM* 136.50
SuperCalc II	*Apple* 195.00 *IBM* 195.00
Super Calc III *IBM*	249.00
SUMMA	
Complete System	*Apple* 450.00 *IBM* 450.00
Trader's Accountant	*Apple* 230.00 *IBM* 230.00
Trader's Data Manager	*Apple* 135.00 *IBM* 135.00
Trader's Forecaster	*Apple* 165.00 *IBM* 165.00
TIMEWORKS	
Cash Flow Management *C-64*	41.97
Money Manager *IBM*	41.97
Sales Analysis Management *C-64*	41.97
Wallstreet *IBM*	28.00
VISICORP	
Advanced Version IIe *Apple*	195.00
Advanced Version III *Apple*	195.00
Business Forecasting Model *IBM*	65.00
Business Forecasting Model II *Apple*	65.00
Business Forecasting Model III *Apple*	65.00
Desktop Plan *IBM*	199.50
Desktop Plan II *Apple*	165.00
FlashCalc II, IIe, IIc *Apple*	66.00
Visicalc 1.2 *IBM*	66.00
Visicalc 4 *IBM*	165.00
Visicalc IIe *Apple*	165.00
VisiOn Calc *IBM*	255.00

Graph/Plot/Chart

DIGITAL RESEARCH	
Dr. Draw *IBM*	195.00
Dr. Graph *IBM*	195.00
MICROPRO	
ChartStar *IBM*	255.00
MICROSOFT	
Microsoft Chart *IBM*	165.00
MUSE COMPANY	
Data-Plot *Apple*	41.97
SOFTWARE PUBLISHING	
PFS Graph *IBM*	87.50
PFS Graph II *Apple*	79.50
PFS Graph IIe, IIc *Apple*	79.50
PFS Graph III *Apple*	115.00
VISICORP	
VisiOn Graph *IBM*	165.00
Visitrend/Plot	*Apple* 66.00 *IBM* 66.00

Graphics

BAUDVILLE	
Blazing Paddles *Apple*	34.97
Pixit *Apple*	34.97
Take 1 *Apple*	41.97
BEAGLE BROS.	
Apple Mechanic *Apple*	20.65
Beagle Graphic *Apple*	41.97
Frame-Up *Apple*	20.65
Triple Dump *Apple*	28.00
BRODERBUND	
Arcade Machine *Apple*	41.97
DIGITAL RESEARCH	
Graphics *IBM*	325.00
HAYDEN SOFTWARE	
Davinci Houses *Apple*	34.97
Davinci Interior *Apple*	34.97
Davinci Landscape *Apple*	34.97
HES	
Turtle Graphics *C-64*	34.97
KOALA	
Gibson Light Pen *C-64*	66.50
KoalaPad	*Apple* 82.50 *IBM* 82.50 *C-64* 77.00
KoalaPad w/Micro Illustration	*Apple* 82.50 *C-64* 66.50
KoalaPad w/PC Design *IBM*	99.50
MAGNUM	
McPic *Apple*	34.97
MICROSOFT	
Macintosh Chart *Apple*	82.50
PENGUIN	
Additional Typesets *Apple*	13.97
Cat Graphics *Apple*	24.47
Complete Graphics *Apple*	55.97
Covered Mirror *Apple*	24.47
Graphics Magician *Apple*	41.97
Graphics Magician Picture Painter	*IBM* 34.97 *C-64* 28.00
Magic Paint Brush *Apple*	24.47
SUBLOGIC	
Basic 3D Graphics *Apple*	28.00
Graphics Editor *Apple*	83.97

Home Finance

BATTERIES INCLUDED	
Checkbook *C-64*	20.97
Home Inventory *C-64*	20.97
CONTINENTAL	
Home Accountant	*Apple* 52.47 *IBM* 99.50 *C-64* 52.47
Home Cataloger *C-64*	34.97
CREATIVE SOFTWARE	
Car Costs *C-64* (Cass or Disk)	13.97
Decision Maker *C-64* (Cass or Disk)	13.97
Home Inventory *C-64* (Cass or Disk)	13.97
Household Finance *C-64* (Cass or Disk)	24.47
Loan Analyzer *C-64* (Cass or Disk)	13.97
HES	
Finance Manager	*Apple* 66.50 *IBM* 97.97
Timemoney Manager *C-64*	20.97
MONOGRAM	
Dollars and Sense	*Apple* 65.00 *IBM* 99.00
TIMEWORKS	
Data Manager *C-64*	17.47
Electronic Check Book	*IBM* 48.97 *C-64* 17.47
Money Manager	*IBM* 41.97 *C-64* 17.47

Integrated Programs

ALPHA	
Electric Desk *IBM*	225.00
ALS	
T/Maker *Apple*	179.00
SOFTWARE PRODUCTS INTERNATIONAL	
Open Access *IBM*	429.00

Interpreters

MICROSOFT	
Basic Interpreter *IBM*	230.00
Mulisp/Mustar-80 *Apple*	135.00
Z-80 Softcard (BASIC-80) *Apple*	255.00

Language

BLUE SKY SOFTWARE	
Super Basic 64 *C-64*	28.00
DIGITAL RESEARCH	
Pascal/MT+ *IBM*	395.00
Dr. Logo *IBM*	105.00
HES	
HES 64 Forth *C-64*	28.00
HES Mon *C-64*	28.00
6502 Prof. Development *C-64*	20.97

Mathematics/ Engineering

DIGITAL RESEARCH	
Access Manager *IBM*	315.00
MICROSOFT	
Adios Mu Math/Mu Simp-80 *Apple*	175.00
Mu Math *IBM*	210.00
Mu Math/Mu Simp-80 (Req. Z-80 Card) *Apple*	175.00

Programming Utility

ADVANCED IDEAS	
Bug Byters	*Apple* 33.25 *IBM* 33.25
APPLIED SOFTWARE TECHNOLOGY	
Pascal Interface	*Apple* 171.50 *IBM* 171.50
BEAGLE BROS.	
Alpha Plot *Apple*	27.65
Beagle Basic *Apple*	24.47
Diskquick *Apple*	20.65
DOS Boss *Apple*	16.80
Double-Take *Apple*	24.47
Fat Cat *Apple*	24.47

PROGRAMMING UTILITY CONT.

BEAGLE BROS.	
Flex Text *Apple*	20.65
Global Program Line Editor *Apple*	34.97
Pronto DOS *Apple*	20.65
Silicon Salad *Apple*	17.47
Tip Disk #1 *Apple*	14.00
Utility City *Apple*	20.65
BLUE SKY SOFTWARE	
Add-on-Basic *C-64*	28.00
SuperCopy 64 *C-64*	28.00
The Last One	*Apple* 206.50 *IBM* 276.50
DIGITAL RESEARCH	
Display Manager *IBM*	350.00
EDU-WARE/PEACHTREE	
Hands on Basic *Apple*	55.30
MECA	
Basic Building Blocks	*Apple* 55.97 *IBM* 55.97
Basic Building Blocks Pro Dos *Apple*	55.97
MICROLAB	
Lifesaver *Apple*	17.50
MICROSOFT	
MS Sort *IBM*	136.50
Premium Softcard IIe *Apple*	276.50
PENGUIN	
Disk Arranger *C-64*	20.97
TIMEWORKS	
Programming Kit #1 *C-64*	17.47
Programming Kit #2 *C-64*	17.47
Programming Kit #3 *C-64*	17.47

Project Planning/ Scheduling

HARVARD	
Harvard Project Manager *IBM*	276.50
HES	
Memory Minder *Apple*	31.47
MICROSOFT	
Microsoft Project *IBM*	175.00
VISICORP	
Visischedule	*Apple* 104.30 *IBM* 136.50
Visischedule III *Apple*	104.30

Property Management

CONTINENTAL SOFTWARE	
Property Management	*Apple* 346.50 *IBM* 346.50
SYSTEMS PLUS	
Landlord Demo *IBM*	52.50

Tax

CARDCO	
Tax Survival *C-64*	28.00
CONTINENTAL	
Tax Advantage	*Apple* 48.97 *IBM* 48.97 *C-64* 48.97
MICROLAB	
Tax Manager	*Apple* 126.00 *IBM* 175.00
TIMEWORKS	
Swiftax *C-64*	34.97

Printers

BROTHER PRINTERS LETTER QUALITY	
HR-15XL, 17 CPS	355.00
HR-25, 23 CPS	615.00
HR-35, 36 CPS	850.00
BROTHER DOT MATRIX PRINTERS	
2024L LQ/Graphics 24 PIN	895.00
M1009 Matrix	179.00
HR-5 Thermal Portable	165.00
CF-50 Cut Sheet Feeder HR-15	169.00
TF-50 Tractor Feed HR-15	99.00
KB-50 Keyboard for HR-15	139.00
CF-100 Sheet Feed HR-25/35	179.00
TF-100 Tractor Feed HR-25/35	109.00
SF-50 Cut Sheet Narrow 2024L	199.00
SF-200 Cut Sheet Wide 2024L	289.00
"NEW STAR PRINTERS"	
SG-10 FT	245.00
SG-15 FT	395.00
SD-10 FT	359.00
SD-15 FT	475.00
SR-10 FT	515.00
SR-15 FT	615.00
SB-10	735.00
Power Type Daisy Wheel Printer	345.00
CITIZEN PRINTERS	**CALL**
OKIDATA	**CALL**
NEC	**CALL**
MACINTOSH SOFTWARE	**CALL**

Computers

Columbia Portables 256K	1895.00
Columbia Desk Top 128K	1795.00
Corona Portable 256K	1795.00

Word Processing

ADVANCED LOGIC SYSTEMS	
Handlers *Apple*	118.97
Word Handler IIe *Apple*	55.97
ARKTRONICS	
Jane w/Mouse *Apple*	125.30
Jane w/out Mouse *Apple*	206.50
BATTERIES INCLUDED	
Paper Clip *C-64*	62.97
Paper Clip w/Spell Pack *C-64*	83.97
BLUE SKY SOFTWARE	
Script 64 *C-64*	62.97
BRODERBUND	
Bank Street Writer	*Apple* 48.97 *IBM* 55.97 *C-64* 48.97
CARDCO	
Write Now! *C-64*	34.97
CREATIVE SOFTWARE	
Creative Writer	*IBM* 34.97 *C-64* 34.97
HARPER & ROW	
The Write Stuff *Apple*	41.97
HAYDEN	
Executive Assistant *IBM*	69.97
Membership Manager *IBM*	69.97
The Writer *IBM*	34.97
Writing Tool Kit *IBM*	55.97
HES	
HES Writer *C-64*	20.97
IUS	
Easy Writer II System *IBM*	276.50
KENSINGTON MICROWARE	
Format IIe *Apple*	105.00
MICROPRO	
Professional Option Pak (Mailmerge, Spellstar, Star Index)	*Apple* 241.50 *IBM* 241.50
WordStar	*Apple* 346.50 *IBM* 346.50
WordStar/Mail Merge	*Apple* 175.00 *IBM* 175.00
WordStar Professional	*Apple* 346.50 *IBM* 486.50
WordStar Professional Plus *IBM*	626.50
WordStar Professional w/free CPM *Apple*	486.50
WordStar/Spell Star	*Apple* 105.00 *IBM* 105.00
WordStar/Star Index	*Apple* 136.50 *IBM* 136.50
WordStar w/free CPM *Apple*	346.50
MICROSOFT	
Microsoft MAC Word *Apple*	136.50
Multi-Tool Word *IBM*	262.50
Multi-Word/Mouse *IBM*	332.50
MONOGRAM	
Bankstreet Writer/Dollars and Sense IIe *Apple*	167.97
MULTIMATE INTERNATIONAL	
MultiMate *IBM*	346.50
MUSE	
Super Text Home Office *Apple*	87.50
Super Text Professional	*Apple* 122.50 *IBM* 122.50 *C-64* 69.30

More Listings on Next Page

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Business and Professional

WORD PROCESSING CONT.

PEACHTREE			
Peachtext (Apple II, IIe) *Apple*			175.00
Peachtext 5000 *IBM*			297.50
PROFESSIONAL SOFTWARE			
Word Plus *IBM*			276.50
Word Plus Jr. *IBM*			104.97
Word Plus with the Boss *IBM*			346.50
Wordpro 3 Plus 2/Spellright *C-64*			69.97
SAMNA INC.			
Samna Word I *IBM*			206.50
Samna Word II *IBM*			315.00
Samna Word III *IBM*			385.00
SELECT INFORMATION			
Free Style Word Processings *IBM*			206.50
Select Bilingual *IBM*			276.50
Select Write *IBM*			69.30
SIERRA ON-LINE			
HomeWord	*Apple* 48.97		*C-64* 48.97
HomeWord 4-pac	*Apple* 195.97		*C-64* 195.97
HomeWord 6-pac	*Apple* 293.79		*C-64* 293.79
Screenwriter IIe *Apple*			90.97
SOFTWARE PUBLISHING			
PFS Write *IBM*			87.50
PFS Write IIe: IIc *Apple*			79.50
SORCIM			
SuperWriter	*Apple* 206.50		*IBM* 206.50
STATE OF THE ART			
Word Processing (II) *Apple*			276.50
STONEWARE			
D.B. Master Business Writer *Apple*			104.30
TIMEWORKS			
Word Writer *C-64*			34.97
TOTAL SOFTWARE			
Total Text *C-64*			30.80
VISICORP			
VisiOn Word *IBM*			262.50
Visiword Plus *IBM*			136.50

Word Processing Utility

ADVANCED LOGIC SYSTEMS			
List Handler *Apple*			55.97
Spell Handler *Apple*			41.97
The Handlers *Apple*			118.97
BRODERBUND			
Bankstreet Speller *Apple*			48.97
Print Shop *Apple*			34.97
Print Shop Refill *Apple*			10.47
CARDCO			
Mailing Disk *C-64*			28.00
CONTINENTAL SOFTWARE			
FCM Filing, Cataloging and Mailing (formerly 1st Class Mail)	*Apple* 69.97	*IBM* 87.47	*C-64* 34.97
DELTA POINT			
Business Letter Library *IBM*			69.97
HAYDEN			
The Calendar *IBM*			34.97
The List Manager *IBM*			34.97
The Planner *IBM*			34.97
The Speller *IBM*			34.97
HES			
Omni Writer/Spell/Multiplan *C-64*			97.97
IUS			
Easy Mailer *IBM*			175.00
Easy Speller II *IBM*			276.50
KOALA			
Speed Key *IBM*			13.97
Speed Key System *IBM*			69.97
Speed Key Tablet w/Software *IBM*			139.97
MICROPRO			
Calcstar	*Apple* 136.50		*IBM* 136.50
Correct Star *IBM*			136.50
Infostar Plus *IBM*			416.50
Infostar w/free CPM *Apple*			346.50
Mailing List & Business Letters *IBM*			69.30
Mailmerge	*Apple* 175.00		*IBM* 175.00
Planstar *IBM*			486.50
Report Star	*Apple* 245.00		*IBM* 245.00
Spellstar	*Apple* 105.00		*IBM* 105.00
Star Index *IBM*			136.50
Wordstar Extended Lesson *IBM*			55.97
MUSE COMPANY			
Address Book *Apple*			34.97
Formletter Module *Apple*			70.00
PEACHTREE			
Black's Law Dictionary *IBM*			175.00
List Manager (Apple II, IIe) *Apple*			175.00
Stedman's Medical Dictionary *IBM*			175.00
SENSIBLE SOFTWARE			
Sensible Speller *Apple*			87.50
Sensible Speller Pro DOS *Apple*			87.50
SIERRA ON-LINE			
Dic-tion-ary *Apple*			69.97
Homeword Speller	*Apple* 34.97		*C-64* 34.97
Homeword Speller Bundle *C-64*			69.97
SOFTWARE PUBLISHING			
PFS: Access (IIe, IIc)	*Apple* 49.00		*IBM* 66.50
PFS: Proof *IBM*			66.50
SORCIM			
Spellguard	*Apple* 136.50		*IBM* 136.50
TOTAL SOFTWARE			
Total Label *C-64*			16.80
Total Speller *C-64*			24.50

Entertainment Software

HAYDEN			
Sargon II	*Apple* 34.97	*IBM* 34.97	*C-64* 13.97
Sargon III	*Apple* 34.97		*Apple* 28.00
INFOCOM			
Deadline	*Apple* 34.97		*IBM* 34.97
Enchanter	*Apple* 34.97	*IBM* 34.97	*C-64* 34.97
Infidel	*Apple* 34.97	*IBM* 34.97	*C-64* 34.97
Planetfall	*Apple* 34.97	*IBM* 34.97	*C-64* 34.97
Seastalker	*Apple* 28.00		*C-64* 28.00
Suspended	*Apple* 34.97		*IBM* 34.97
Witness	*Apple* 34.97	*IBM* 34.97	*C-64* 34.97
Zork I	*Apple* 28.00		*IBM* 28.00
Zork II	*Apple* 28.00		*IBM* 28.00
Zork III	*Apple* 28.00		*IBM* 28.00
MICROSOFT			
Flight Simulator *Apple, IBM, C-64*			34.97
MUSE			
Advanced Blackjack *Apple*			34.97
ODESTA			
Backgammon IIc	*Apple* 24.47	*IBM* 34.97	*C-64* 34.97
Checkers	*Apple* 34.97		*C-64* 34.97
Checkers IIc *Apple*			24.47
Chess 7.0	*Apple* 48.97		*C-64* 48.97
How About a Nice Game of Chess IIc	*Apple* 24.47	*C-64* 20.96	
SCARBOROUGH			
Songwriter	*Apple* 27.97	*IBM* 27.97	*C-64* 27.97
SCREENPLAY			
The Trivia Arcade		*IBM* 24.47	*C-64* 24.47
SEGA			
Star Trek	*Apple* 31.47	*IBM* 31.47	*C-64* 28.00
SIERRA ON-LINE			
Crossfire	*Apple* 20.97	*IBM* 20.97	*C-64* 20.97
Frogger	*Apple* 24.47	*IBM* 24.47	*C-64* 24.47
Ultima II	*Apple* 41.97	*IBM* 41.97	*C-64* 41.97

Educational Software

ADVANCED IDEAS			
The Game Show (Master)	*Apple* 28.00	*IBM* 28.00	*C-64* 24.47
Master Match (Master)	*Apple* 28.00	*IBM* 28.00	*C-64* 24.47
Tic Tac Show (Master)	*Apple* 28.00	*IBM* 28.00	*C-64* 24.47
Wizard of Words (Master)	*Apple* 28.00	*IBM* 28.00	*C-64* 24.47
BARRON'S			
Computer SAT	*Apple* 62.97	*IBM* 62.97	*C-64* 62.97
GMAT	*Apple* 62.97	*IBM* 62.97	*C-64* 62.97
CBS SOFTWARE			
Adventure Master	*Apple* 31.47	*IBM* 31.47	*C-64* 31.47
Astro-Grover (Cass or Disk)	*Apple* 34.97	*IBM* 34.97	*C-64* 31.97
Big Bird Fun House (Cass or Disk)			*C-64* 31.97
Big Bird's Special Delivery (Cass or Disk) *C-64*			24.47
Career Planning	*Apple* 55.97		*IBM* 55.97
Coast to Coast	*Apple* 34.97	*IBM* 34.97	*C-64* 34.97
Coco Notes *C-64*			23.00
College Board	*Apple* 122.50		*IBM* 122.50
Delegation: Time and Tasks	*Apple* 55.97	*IBM* 55.97	
Dinosaurs Dig	*Apple* 34.97	*IBM* 34.97	*C-64* 34.97
Dreamhouse		*Apple* 28.00	*C-64* 28.00
Driving		*Apple* 55.97	*IBM* 55.97
Duck's Ahoy (Cass or Disk) *C-64*			23.00
Ernie's Magic Shapes (Cass or Disk) *C-64*			24.47
Fleet Feet *C-64*			28.00
Forecasts	*Apple* 34.97	*IBM* 34.97	*C-64* 34.97
Goren's Bridge	*Apple* 55.97	*IBM* 55.97	*C-64* 55.97
GRE Tests		*Apple* 105.00	*IBM* 105.00
Halftime (Cass or Disk) *C-64*			23.00
Honey Factory	*Apple* 34.97	*IBM* 34.97	*C-64* 34.97
Letter Go Round (Cass or Disk) *C-64*			31.47
Light Waves *C-64*			28.00
Managing for Success People Management	*Apple* 55.97	*IBM* 55.97	
Managing for Success Personal Development	*Apple* 55.97	*IBM* 55.97	
Mastering SAT	*Apple* 105.00		*IBM* 105.00
Match Wits	*Apple* 20.97	*IBM* 20.97	*C-64* 20.97
Math Mileage *C-64*			23.00
Micro Speed Road	*Apple* 87.50		*IBM* 87.50
Murder by the Dozen	*Apple* 24.47	*IBM* 24.47	*C-64* 24.47
Musical Madness *C-64*			23.00
Pathwords	*Apple* 24.47	*IBM* 24.47	*C-64* 24.47
Peanut Butter Panic *C-64*			23.00
Problem Solving	*Apple* 55.97		*IBM* 55.97
SAT *C-64*			105.00
Sea Horse Hide n Seek *C-64*			23.00
Weather *C-64*			27.97
Webster: The Word Game	*Apple* 23.00	*IBM* 23.00	*C-64* 23.00
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Assembly Language
Continued from page 59

written, assembly language has traditionally been thought to be completely non-portable. As one wag has observed, "[traditional] AL defines what it means to be non-portable."

Development Time: It is generally agreed and even more widely assumed that programs can be written more quickly in high level languages. Since each HLL instruction is often equivalent to twenty or more assembly language instructions, it is true that a single HLL instruction can cause a computer to do a lot more than a single AL instruction.

But coding is only one part of the development of a good software package. Newer concepts of software development emphasize that coding is only one of several aspects of programming. In terms of coding, it is true that high level language programs are generally more quickly written. The design, documentation and testing of a program, however, are just as important, if not more important, than the actual coding. As a result, programming should be thought of as a total development effort and not just as coding. When the total development effort -- and not simply coding -- is taken into account, a different picture emerges. See figure 1 for a comparison.

It is often claimed that the coding for a HLL program will take half the time for the same task as for an AL program. Let's suppose that this is correct. Even if it is, however, it doesn't follow that program-

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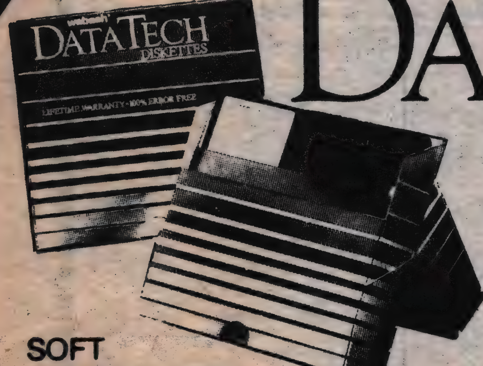

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Assembly Language Continued from page 164

	High Level Lang.	Assembly Lang.
Design	40	40
Documentation	20	20
Coding	10	20
Testing	20	20
Total	90	100

note: numbers are in units of time

Figure 1: Total Development Effort: **Coding is only one aspect of software development. When other aspects are taken into account, the advantage of HLLs over AL is much smaller than is often supposed.**

ming in a high level language takes half the time it takes for assembly language. The design, documentation, and testing time requirements are roughly comparable. When it is taken into account that coding is only one part of programming, it turns out that the total development time advantage of HLL over AL is on the order of 10 percent or so, not the often claimed 50 percent. Moreover, the same small advantage can be realized in the maintenance or rewriting of existing programs. The advantage of HLL over AL in terms of software development expense, therefore, is real but fairly modest.

The Advantages of Traditional Assembly Language

Execution Speed: Too much attention is being paid to faster computer hardware in the quest for faster execution times. Good algorithms written in an efficient language such as AL is a more promising ticket to faster execution. In fact, a program written in assembly language will generally run 4 to 10 times faster than a HLL program, same task, same computer. High level languages are "fast," therefore, in the most shortsighted way. HLLS are well suited for programs which will be used infrequently or for programs where speed is not important. For frequently used, more time-critical programs dealing with anything more than a small amount of data, AL remains the language with the most advantages.

Let's suppose, as some maintain, that a high level language program can be written in one half the time it takes to write a comparable assembly language program. If it takes 30 hours to write it in Pascal, for example, and it takes 60 hours to write it in AL, a savings of 30 hours has been achieved. But the AL version will execute faster. Suppose that it runs 5 times faster, say 2 minutes versus 10 minutes. We need to remember that programs are used as well as developed. As a result, we should be concerned with the overall time consumption of developing and using the program. As figure 2 illustrates, a program would take less overall time written in AL after just 225 executions, which could be as little as a few weeks of use. If the program is to be used often, assembly language programs will consume considerably less time overall, making the added development time of AL a sound investment.

	HLL	AL	Difference
Development	30	60	30 (hrs)
Execution Time	10	2	8 (min)
Executions to Recover the Difference		225	225 8) 30x60

Figure 2: Overall Time Consumption: **Even if an AL program takes much longer to develop, with its faster execution it will take a relatively small amount of program use to recover the greater initial development time. As a result, AL enjoys an advantage in overall time consumption.**

Machine Control: High level languages are deliberately microprocessor independent, they frost over the view into the computer system. The price paid for this independence is less control over the resources of each computer. In too many cases, programs have to be tailored to the limitations of a HLL rather than the full capabilities of the computer. This is especially true with the formatting of reports and the organization of input data.

With assembly language, by contrast, the computer is more transparent to the programmer. AL is more like a window in to the programming capabilities of the computer. As a result, the limitations are those of the programmer rather than the language.

Ease of Learning: Contrary to popular belief, assembly language in many respects is easier to learn than a high level language. Though AL programs often require more instructions, the instructions themselves are on the whole simpler to learn and use than HLL instructions. HLL instructions presuppose a host of rules and restrictions that must be remembered. Often, their quirks are context dependent -- numerous run time errors develop in some situations that don't occur in others. Undocumented quirks and side effects stemming from using instructions in certain ways frequently bedevil HLL programming.

Reflecting increased interest in computers over the last few years, a number of AL texts have appeared but their general usefulness is limited because they are restricted to only one micro or one micro family. Too often, as well, these AL texts seem to be written *by* technically minded people *for*technically minded people. With the development of universal, machine-independent AL, however, a less microprocessor-specific AL text can be written. It need not be confined to a single micro and, consequently, AL concepts can be presented both more generally and more clearly.

How Assembly Language Can Be Universal

Current assemblers for the various microcomputers use different instruction mnemonics and formats for exactly the same operation. In fact, a single assembler will often use several mnemonics for the same basic operation. This not only complicates porting a program from one computer to another, it makes learning assembly language needlessly difficult. By using a standard or universal set of mnemonics and instruction formats, AL is not only easier to learn and use, it is simpler to transfer programs from one computer to another.

Consider the following four instructions from the standard 8080 instruction set:

```
LDA aa      ; load reg A, absolute location
MOV A,M     ; load reg A, indirect reg H
LDAX B      ; load reg A, indrect reg BC
LDAX D      ; load reg A, indirect reg DE
```

These four instructions perform essentially the same operation -- namely, of moving a single byte of data from memory to the A register. The last three instructions are unique to the 8080 family. These four instructions can be replaced by a single mnemonic which uses a standard format, one which is common to all other computers and the other move data instructions of the 8080. For example, consider these four replacements:

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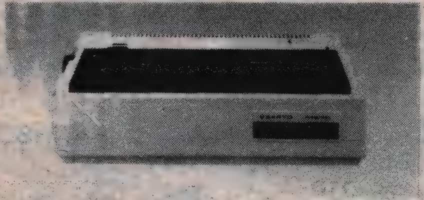

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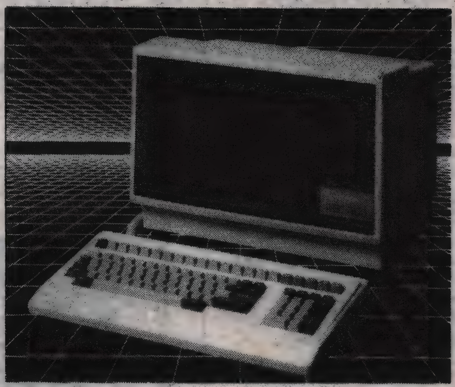

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Assembly Language
Continued from page 166

```
MOV  A, Abs aa
MOV  A, (HL)
MOV  A, (BC)
MOV  A, (DE)
```

This eliminates the use of two unnecessary mnemonics, specifically LDA and LDAX and special abbreviations, specifically, M for HL, B for BC and D for DE. More important is the fact that converting these universal instructions for use on another computer is simplified. The most that will have to be changed in this case are the register designators, i.e., HL, BC and DE. The use of universal instruction mnemonics and format also makes it easier for someone who knows AL but who may not be familiar with 8080 AL to understand a program written for the 8080 -- or, indeed, for any micro.

How Assembly Language Can Be Machine-Independent

A large part of any program consists of a few basic procedures. Although the code which is required to perform these procedures may vary from computer to computer, the procedure is the same. A standard set of mnemonics can be used to represent those procedures which are common to all microprocessors.

For example, suppose we wished to move a double byte of data from one memory location to another. 8080 AL and Universal AL would compare as follows:

```
        8080                         Universal
LHLD aa  ; load reg HL          MOVVW   to, from
SHLD aa  ;  store reg HL
```

Not only does Universal AL decrease the number of instructions required to write a program and therefore make understanding the program easier, the instruction (MOVVW) is microprocessor independent. Procedural instructions, such as MOVVW, can be reassembled for execution on any micro without changing the source code.

More complex procedures can be implemented by means of macros. For instance, consider the macro instruction.

```
ATON buffer, # of chars, variable     ; convert an ASCII string to
                                      ; a single byte value
```

This instruction uses the same basic format as any other AL instruction and is computer independent. The code required to perform the procedure is written as a separate external relocatable subroutine. Unlike conventional macro assemblers, the assembler can convert the instruction into a call to the subroutine, passing along the parameters and appending the subroutine to the end of the program in such a way that the subroutine itself is included in the executable file only once.

Conclusion

Although traditional assembly language suffers from a number of difficulties, these problems can be overcome. With the introduction of a standard and the implementation of some universal concepts, AL becomes more appealing for applications which formerly would have been thought appropriate only for a HLL. What is required is a universal assembler which is capable of generating machine code for any computer -- which no single assembler or compiler currently can do.

We have been developing a Universal Machine-Independent Assembly Language for the past four years. Although it requires some deviation from any given manufacturer's instruction set, a programmer using a Universal Machine - Independent AL can develop assembly language programs which are just as fast and powerful as traditional AL programs and which are nearly as portable as HLL programs. The result is that the programmer enjoys many of the advantages of both HLL and AL.

Note: Robert Fitz, an engineer and programmer for over 20 years, is developer of MOPI, a CP/M and PC-DOS based universal assembler. MOPI will soon be marketed by VOCS of Minneapolis. Larry Crockett teaches microcomputers and artificial intelligence at Metropolitan State University in Minneapolis. Together, they are finishing a Universal Machine-Independent AL textbook tentatively entitled **Universal Assembly Language.** ●

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Introducing The Sinclair QL

by Stan Veit

Editor's Note: This is not an equipment review, it is an advanced evaluation from material supplied by Sinclair and from observation at the Winter Consumer's Electronics Show in Las Vagas in January, 1985. Computer Shopper has been promised a review machine as soon as one is available.

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Last year Sinclair Research announced the Sinclair QL in the U.S. As it turned out the announcement was quite premature since the QL (for Quantum Leap) did not make the trans-Atlantic crossing for several reasons, first, Sinclair had production problems and could not fill the orders they had taken in the U.K., second, with the withdrawal of Timex from the personal computer business, Sinclair had to sort out the contractual obligations and interests between the two companies.

During 1984 very few QLs got into the U.K. market but those that did, established its reputation for excellence. Sinclair made a half-hearted attempt to test the mail order market for the QL in this country and the results convinced the company that it would do very well when it had machines to meet the demand.

Timex is long gone and the Timex/Sinclair users are still very active and looking for the re-introduction of the QL in the United States. One potential problem Sinclair is looking at very carefully is the general state of the market for low cost computers and trying to judge where the QL fits into the market. QL is not a low cost machine by recent standards, costing $499. However it does include two built-in microdrives, cables and software. This is everything you need except a video monitor and you can use your TV in place of a monitor. The competitive computers from Atari and Commodore are cheaper to start with but the entry price does not buy a complete system. When you add disk drives, cables and software, the total system price is much higher than $499.

As shown in Figure 1, the Sinclair QL is a very attractive keyboard unit containing a powerful 68008 processor, a 32- bit processor running in an 8-bit bus. The advantage of this arrangement is that the power of the M 68000 is obtained with the economy of 8-bit memory. This is the same concept used by IBM with the

Continued on page 172

Interview With Nigel Searle
Continued from page 169

Q: When do you expect to have QLs available for the American market?

A: I think we'll be delivering in April. We've got a very substantial mailing list of people who previously have bought Sinclair products, as well as several thousand people who have specifically requested information on the QL. As soon as we get the FCC clearance we'll begin with a direct mail campaign to those people whose names and addresses we already have, and that will all be handled out of the Boston office. Then we'll have the mail order ads appear.

Q: How about selling in stores?

A: We're very open minded about where we go afterwards. We have already planned to sell the product in two retail stores close to Boston. We want to learn what problems and obstacles might be faced in selling the product in stores in the U.S.

Q: How will support be provided for U.S. buyers?

A: We're negotiating an agreement with one of the very large nationwide service organizations.

Q: What will be your target audience in the U.S.?

A: I think initially they'll be fairly sophisticated existing computer users who would like the power of the Macintosh but can't afford to spend $2,000. Literally, for a quarter of the price, they're gonna get some pretty decent software, color graphics, and so forth.

Q: Is there anything else you'd like to add?

A: No. I think we've covered most of it ... except that we'll be showing the QL - and our new Flat-Screen TV - at the Consumer Electronic Show in Las Vegas later this month.

Q: Well, thank you, Mr. Searle, for a most interesting interview - and Happy New Year!

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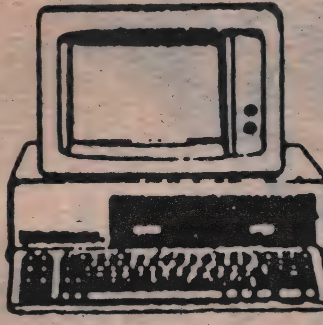

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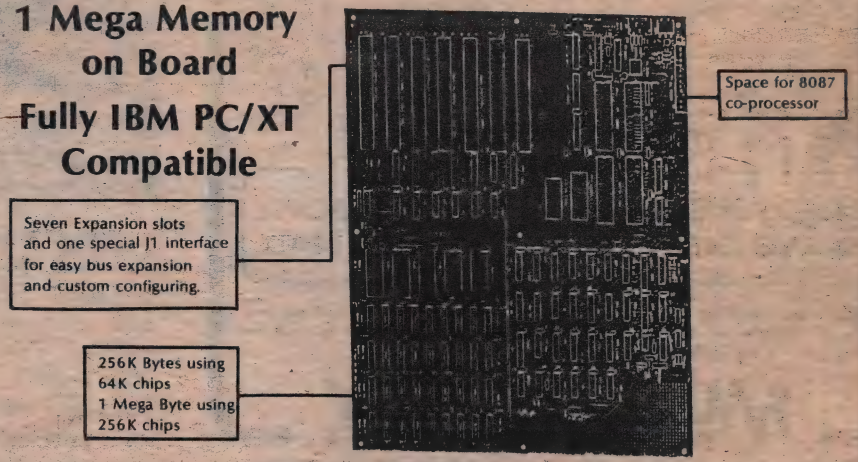
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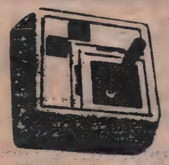

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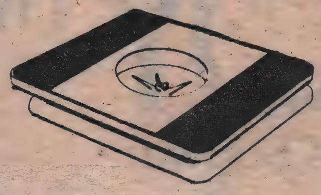

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Introducing Sinclair QL
Continued from page 170

8088 CPU in the IBM PC. Sinclair also has freed the 68008 of the slower housekeeping tasks. A second processor, the Intel 8049 controls the keyboard, generates the sound and acts as an RS-232C receiver. Two custom Sinclair ICs control the display, memory, microdrives, clock local area network and serial communications.

The QL comes with 128K bytes of RAM but has a plug-in expansion unit available, increasing the RAM to a huge 640K simply by plugging in a RAM cartridge (Figure 2). QL also has built-in provisions for a Local Area Network, the QLAN which lets you link up to 64 QLs to share files and data between machines. The LAN operates over a serial link at 100K baud.

The keyboard is a full sized QWERTY arrangement including shift keys and five function keys. The key action is positive and precise unlike some previous Sinclair computers. The keys are comfortable to use and have a good "feel" to them.

The video display provides two very high resolution modes of operation. One is 512 by 256 pixels in four colors (or shades of gray in monochrome), the other is 256 by 256 pixels in eight colors, or shades of gray. Column format is determined by the number of pixels, normal format is 85 columns by 25 rows. Either RGB or Monochrome monitors may be used. If a TV is used the display modes are the same as with a monitor but normal format is limited to 40 or 60 columns. Both color or monochrome TVs may be used.

The standard I/O port is a serial RS-232C configuration transmitting from 75 to 19,200 baud and receiving up to 9600 baud. A parallel printer port is available as an option.

Two joysticks ports are provided for Game controllers or mouse inputs and a ROM port for QL ROM plug-ins. Up to 32K of ROM can be used in a plug-in.

Microdrives

The most controversial part of the Sinclair QL is the microdrives. Two of these digital tape drives are built into the QL and up to six more microdrives can be added. Each of these use a small tape cassette (Figure 3) which can store up to 100K bytes and has an average access time of 3.5 seconds (10 to 20 times the speed of an audio cassette system.) In the U.K. where people are willing to accept cassette data storage, the microdrives seem to be popular except that the supply of cassettes has not kept up with demand. In the United States people have not been willing to accept cassette data storage for anything more serious than the Timex/Sinclair Z81-TS-1000. The ADAM computer was the last machine to try to use them

Continued to page 174

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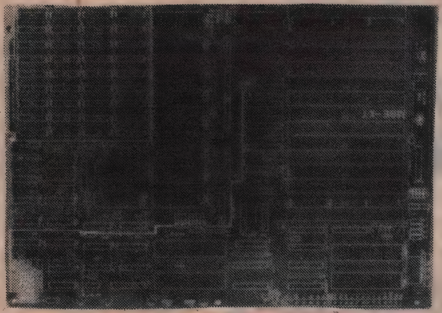

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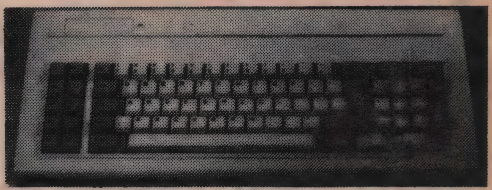

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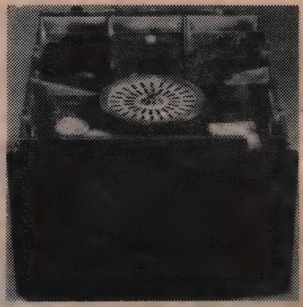

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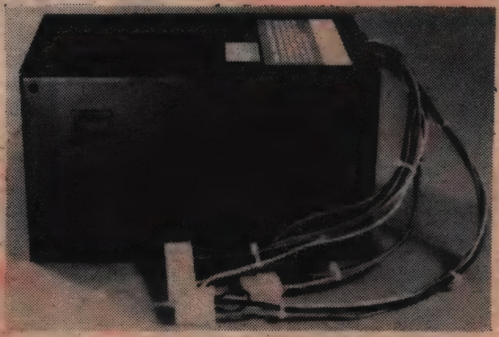

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Introducing Sinclair QL Continued from page 172

and even Coleco was about to give up and introduce floppies when they closed down. The Stringy Floppies have been around for a long time for TRS-80, Atari, COCO. Model 100, and many other machines. They have never been accepted by a large number of users. Commodore's experience with data storage is that most users buy a disk drive with the C64 computer. It will be interesting to see if the microdrives will sell in the US.

Sinclair has provided a very powerful language called Super BASIC for the QL. It incorporated many of the features of Sinclair BASIC plus additional features. It handles strings and arrays and it is a structured and procedure oriented. Execution speed is independent of program size.

For the first time Sinclair has made sure that its computer is supported by applications software from the first release. It bundles the most widely used applications with the computer at no extra cost.

QL Quill is a powerful word processor operating on a "What you see is what you get" principle. It has a command and control panel at the top of the page and many automatic features such as automatic justification when inserting text, copy, tabs, headers, footers, and the ability to view an entire document. It can also import tables and graphs from other sections of the supplied software.

QL ABACUS is an unusual spreadsheet that eliminates the grappling with row and column co-ordinates and replication of formulae over rows and columns. ABACUS uses existing text as sufficient reference for whole rows, columns or individual cells. It will automatically apply the rules of formulas entered to whole rows, columns or blocks of cells with recourse to any complex command structure. E.g. "ROW = 100" will put 100 in each cell in the current row, or one can set up the row as "Profit = Sales – Costs" and ABACUS will put in the formula to subtract the row "COSTS" from the row "SALES."

ABACUS can also use functions for operating on text as well as numbers. These commands include functions for joining of worksheets, multiple windows, justification of text, use of different units such as monetary, integer, percentage, decimal, and exponential form. ABACUS is also faster than most other spreadsheets.

The QL ARCHIVE Database is a relational database that can be used with QUILL and ABACUS. It provides for variable length records and fields and does multifile search and cross reference. It can import or export data to the other parts of the software. Up to 256 fields can exist in each record.

QL EASEL - Easel is the QL graphics software that is totally interactive and very easy to use. It has pre-set formats to make it simple to produce a graph of different colors and styles. It produces line graphs, bar charts and pie charts.

In addition to this software there is a large library of programs developed by third parties during the year that QL has using in the UK. Many of these are directly usable in the United States. ●

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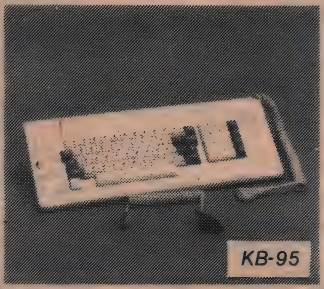
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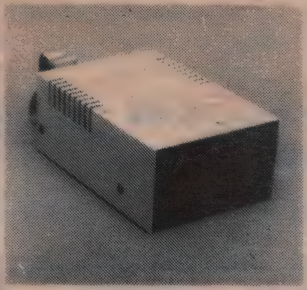

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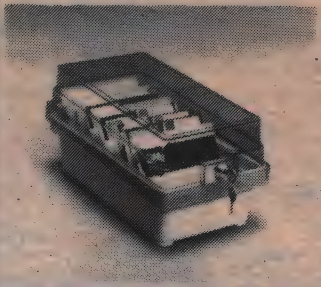

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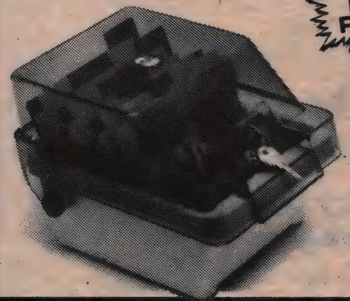

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S & H $11.00

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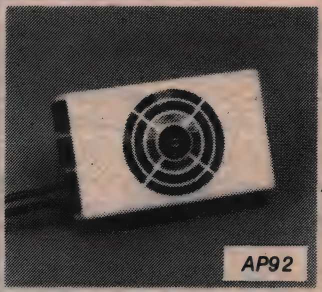
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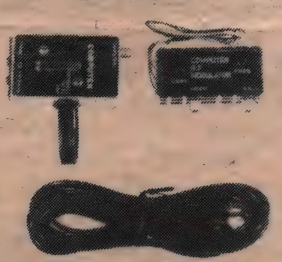

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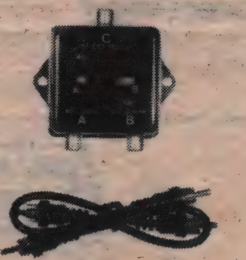

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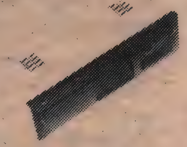

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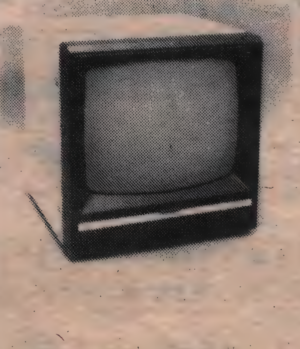

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- **RF MOD. SET:** RF modulator, coaxial cable, TV interface.
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GSN
COMPUTERS

Timex Sinclair Continued from page 61

```
10 FOR F=1 TO 100
     IF INT F/A
20 IFINTF/19=F/19 THEN GOSUB 100
25 IF Q$="N" THEN GOTO 500
30 PRINT F
40 NEXT F
50 STOP
100 PRINT AT 21,0;"PRESS C TO CONTINUE OR N NOT TO"
110 LET Q$=INKEY$
120 IF Q$<>"C" AND Q$<>"N" THEN GOTO 110
130 IF Q$="C" THEN CLS
140 RETURN
500 CLS
510 PRINT "THIS COULD BE THE MENU"
```

```
10 ON ERR GO TO 500
20 FOR f=1 TO 100
30 PRINT f
40 NEXT f
500 ON ERR RESET
510 CLS
520 PRINT "This could be the menu"
```

With this routine on the T/S 2068 the subroutine which we needed in the T/S 1000/1500 program is now totally unnecessary. The T/S 2068 will automatically ask scroll? when the screen is filled. If you press any key except the N or space bar, the screen will scroll to accommodate up to the next twenty-one lines. Pressing either the N key or space bar will cause the program to stop with an error code D BRE 'K. If, however, you have placed an ON ERR GO TO command in the program, as we have done in line 10, control will pass to the line specified in the ON ERR command. In this case you would go to line 500 which could be the menu or other routine.

The final member of the ON ERR trio is ON ERR CONTINUE. This command will cause the program to return to the line where the error occurred and start the program again at the following line. Once again we will use the program which prints out the character set. This time, however, we will start from CHR$ 1 instead of CHR$ 32. Ordinarily the program would stop with an error message INVALID COLOR (try running this program without lines 10, 50, 60 and 500). This time we will use the ON ERR commands to keep the program going.

```
10 ON ERR GO TO 500
20 FOR f=1 TO 255
30 PRINT CHR$ f;
40 NEXT f
50 ON ERR RESET
60 STOP
500 ON ERR CONTINUE
```

When the unprintable characters are encountered, the program jumps to line 500 which instructs it to jump back to the point the error occurred and start execution with the following line.

There is an additional benefit to these commands which many software authors are using now. By placing ON ERR messages within a program, the author can disable the BREAK key making the program unstoppable and unlistable. This is one of the methods being used to combat the current rash of illegal copying of software. (Please, don't write to me to tell me that this method can be easily overcome. I know that there is no foolproof method of copy protection, and have used a number of methods to list supposedly unlistable programs. The purpose, though, was to study the program and/or make a copy for my personal use. As a software author myself, I do not condone the illegal duplication of programs, and would hope to see this practice end.)

For those of you who have been following the rumor mill concerning the upcoming introduction of the Sinclair Spectrum + by Sinclair Research, here is the situation as it stands now. Earlier this year Sinclair did announce that it was considering introducing their updated Spectrum. (It is virtually identical to previous models of the Spectrum, but with an improved case and keyboard.) However, shortly thereafter, the decision was made to introduce the QL, but not the Spectrum +. So for now the only new Sinclair computer to be introduced into the U.S. is the QL. I am hoping soon to be able to give you a review of this new entry.

Editor's Note: My agents in the U.K. tell me that QL deliveries are still running late in spite of Sinclair's opening a new factory. There is some doubt that QLs will be in the U.S. before the summer of 1985. ●

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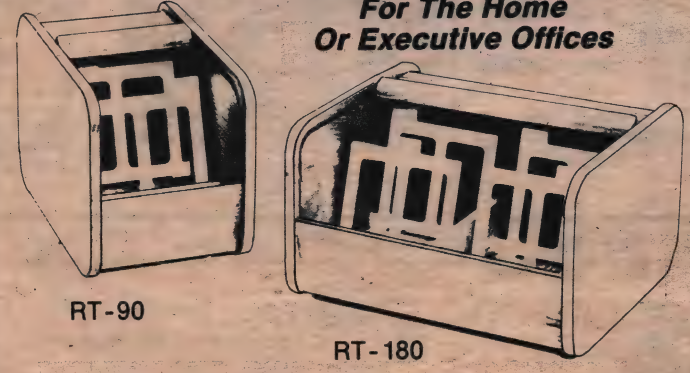
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If you know of or have a trade show, swap meet or club meeting connected with the computer field, we'll run an announcement in the COMING EVENTS section FREE of charge.

MAY 1985

MAY 1-2
Central NY Office/Computer Expo, Syracuse, NY. Call 716-834-9431 for more information.

MAY 1-2
Wichita Computer Expo, Wichita, KS. Call Industrial Presentments for more information 303-696-6100.

MAY 2-4
Byte Computer Show, Anaheim, CA. Call The Interface Group for more info, 617-449-6600.

MAY 6-9
COMDEX, Spring '85. Atlanta, GA. Call The Interface Group for more info, 617-449-6600.

MAY 15-19, 1985
The Washington, D.C. Byte Show will be held in the Washington Convention Center. For more information call The Interface Group at 617-449-6600.

MAY 16-19
Computer Showcase Expo, Washington, D.C., call The Interface Group for more info, 617-449-6600.

MAY 17-19
Rainbowfest, Chicago, IL. Call Falsoft, Inc. for more info, 502-228-4492.

MAY 18, 1985
THE 8TH ANNUAL SHOW & TELL MICROCOMPUTER CONFERENCE will be held at the University of Oklahoma in Norman, OK. The conference brings together microcomputer buffs of all ages and degrees of expertise. For more information and application forms, send a self-addressed, stamped envelope to Show & Tell Computer Conference, Richard V. Andree, O.U. Math Dept., 601 Elm, Norman, OK 73019.

MAY 19,1985
The Iliana Repeater System 16th Annual Hamfest will be held in the UAW Civic Center. For more information call Barbara Tolson at 217-662-8948.

MAY 22-24
Byte Computer Show, Boston, MA. Call The Interface Group for info, 617-449-6600.

JUNE 1985

JUNE 2-5
Consumer Electronics Show/Summer. Chicao, IL. Call CES for more info, 312-861-1040.

JUNE 3-6
Robots 9, Cobo Hall, Detroit, MI. Call 215-384-7262 for more information.

JUNE 6-9
Computer Showcase Expo, Dallas, TX. Call The Interface Group for more info, 617-449-6600.

JUNE 6-9
Computer Showcase Expo, Seattle, WA. Call Interface Group for info, 617-449-6600.

JUNE 11-3
Government Computer Expo, Sheraton Washington Hotel, call 301-695-9562 for info.

JUNE 12-14
PC World Exposition, San Diego, CA. Call Mitch Hall Assoc. for info, 617-329-7466.

JUNE 13-16
Computer showcase Expo, Philadelphia, PA. Call The Interface Group for info, 617-445-6600.

JUNE 17-19
3rd Annual PC Expo, New York, NY. Call 1-800-922-0324 for more information.

JUNE 20-23
Computer Showcase Expo, Milwaukee, WI. Call The Interface Group for info, 617-449-6600.

JUNE 25-27
Computer Graphics '85 West, Los Angeles, CA. Call 703-698-9600 for more info.

JULY 1985

JULY 15-18
1985 National Computer Conference, Chicago, IL. Call AIFPS for info., 703-620-8900.

JULY 25-28
Computer Cornucopia Magazine, Workshop & Outdoor Recreations in Oregon. No charge for workshop, nominal charge for rafting, etc. For information call Dorcas Osensis, 503-382-8048 before July 1, 1985.

AUGUST 1985

AUGUST 13-15
Computer Graphics '85 East, Boston, MA. Call 703-698-9600 for more information.

AUGUST 21-23
MacWorld Exposition, Boston, MA. Call Mitch Hall Associates for info., 617-329-7466.

NOVEMBER 1985

NOVEMBER 10-13, 1985
The Ninth Annual SYMPOSIUM ON COMPUTER APPLICATIONS IN MEDICAL CARE will be held at the Baltimore Convention Center. It will offer a forum for professionals from both the health care and compùters fields to come together, to listen to exchange ideas, to learn from each other and to leave with some new insight into solving problems in medical computing. For further information contact SCAMC, The George Washington University Medical Center, Office of Continuing Medical Education, 2300 K St., N.W., Washington, D.C. 20037.

Ask the Guru

Continued from page 42

hacker-type, and if you can latch onto one of the old 128K boards that get removed during a Fat-Mac upgrade, it's a fairly simple matter to add your own reworked monitor and keyboard. This lets you pick up a Mac-like machine for next to nothing.

Frtunately, the Mac will cold boot on either the external or interal drive. Thus, you can use an *external* add-on drive as your only drive.

Unfortunately, you have to know an insider or else get real lucky to do this. Apple pays dealers a $300 bounty to return the boards. Some Apple developers got ,upgrade kits without having to send the old board in. For some strange reason, these seem to have a street value of $301.00.

It is also feasable to upgrade a 128K Mac to a 512K Fat Mac by yourself, buying RAMs from any of the ads right here in *Computer Shopper*. You must be willing to do the usual cutting, soldering, chopping and channeling. You also will void warranty if you try this. Full details appear in *Dr. Dobbs* Journal, January of 1985, pages 4 and 18-23.

The newest 128K boards are far easier to modify than the earlier ones. Details on both versions appear in the same issue.

How Can I Do Multi-Line Headers or Footers With Applewriter?

Normally, either *Ap-*

Continued on page 179

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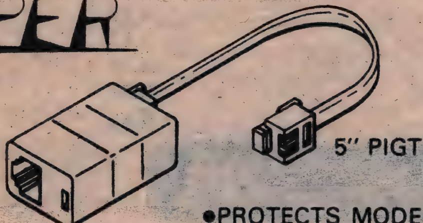

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Ask The Guru
Continued from page 178

plewriter IIe or *ProDOS Applewriter 2.0* will only let you use single line headers or footers. You do have your choice of any combination of top or bottom, left, center, or right headings.

An awful-sounding but simple process will let you do any number of header or footer lines with any spacing and any arrangement. Figure two shows details. The process is easily automated under WPL to let you do it all invisibly and automatically. Naturally, it is best to hold off on WPL until you know exactly what works for you.

Say you want to do a three line header. What you do is print the *bottom* header line *to disk* using good old PD8 and a PI value of 64. PD8 is that magic command that lets you "print" a fully formatted image of what you want on paper to the diskette. Be sure to use a unique and new filename for this PD8 image.

Next, you get the PD8 image back, and then reprint it to disk once again. This time, use a PI value of 65, and a set of "wide open" print constants that do *not* modify the printing process. This time, you use the *second* header line. Typical wide open constants include LM0, TM0, BM0, PM0, UT none, etc.

Finally, get the second PD8 image back, and print to paper. Use wide open print constants and a PI of 66. Note that you can put a page number anywhere on any header or footer line by using a "#" where you want the number to appear. Note that reverse slash delimiters may be used on *ProDOS Applewriter* 2.0 to suppress the headers and footers on the first page.

Well, you get the general idea.

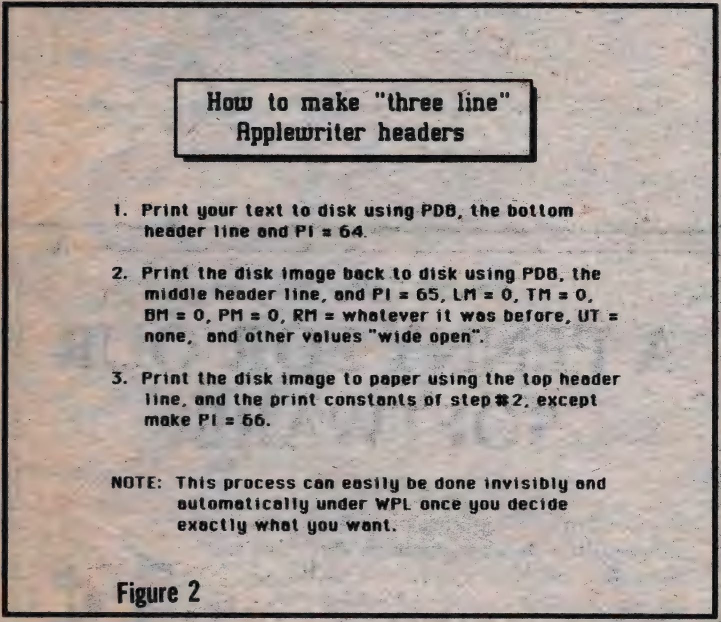
What you end up with depends on what you want. You might improve the header margins by starting with a left margin of zero and a right margin equal to the ultimate *difference* between your intended right and left margins. Use this for the first two passes. Finally, use your real left margin and real right margin for the final hard copy printout.

By the way, the *Computer Shopper* Guru question line is also an *Applewriter* help line that I maintain in cooperation with the *Gila Valley Apple Growers Association*. There's lots of free stuff available, along with sixteen (!) crammed full disk sides of Applewriter toolkits.

What is the Diablo 630 "Second Line" Problem?

The WP-enhanced Diablo 630 daisywheel printer is the de facto standard in daisywheel printers. Sadly, there is a bizarre bug in it called the "second line" problem that can royally foul up the works for you.

The bug is apparently caused by sloppy or wrong initializing of certain variables in the on-board firmware. What happens is this: on the first *right to left* pass after going into fill justify, anything fancy like an underline or a "funny" spoke access will garble the line and foul up the left margin as well.



How to make "three line"
Applewriter headers

1. Print your text to disk using PD8, the bottom header line and PI = 64.
2. Print the disk image back to disk using PD8, the middle header line, and PI = 65, LM = 0, TM = 0, BM = 0, PM = 0, RM = whatever it was before, UT = none, and other values "wide open".
3. Print the disk image to paper using the top header line, and the print constants of step #2, except make PI = 66.

NOTE: This process can easily be done invisibly and automatically under WPL once you decide exactly what you want.

Figure 2

Since you nearly always want to kill the justify on the last line in a paragraph, what happens is that any *second line* in the *next* justified paragraph will louse up if you try anything funny in it.

One sledge hammer cure is to print your entire document right to left only. This slows up your printing time considerably. What I usually do is suppress right to left printing only on the problem paragraphs. The usual way I handle this is to print any paragraph that has *any* underlining at all in it right-to-left only. Should a "funny spoke" get called on line two, I will try to find some excuse to underline something, somewhere in the same paragraph.

I have more specific details on this under WPL. Call or write if you are interested.

Beware of the words "Diablo Compatible." This usually means that the prongs on the power cord of the printer have the same spacing and shape as that on a *Diablo 630*, and will sometimes fit into the same AC wall outlet with a minimum of excessive force. Most toy daisywheel manufacturers are lying through their teeth when they claim Diablo compatibility.

Kiddies, if it doesn't have a ready to use, built-in wall-to-wall proportional space and full firmware microjustify, cannot do HYPLOT vector graphics, won't accept a metal or plastic daisywheel with 88, 92, or 96 petals, doesn't have "near perfect" print quality, has no bidirectional tractor, or won't run *continuously* for 2000 hours before any adjustment, then it just flat ain't Diablo compatible.

While on the subject of *Meleagris Gallaprovos*, beware of those epsilon minus yahoos who use "words per minute" instead of the industry standard "characters per second" when specifying daisywheel printer speed. Thus a toy daisywheel rated at "120" is much *slower* than a real one rated at "40."

Gobble gobble.

Why Does a BOLD PS Daisywheel Foul Up Some Punctuation?

Not all daisywheel elements have the same petals in the same positions. Depending on whether it is a "business,"

Continued on page 180

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Ask The Guru

Continued from page 179

"computer" or "custom" wheel, certain symbols may end up on the wrong petal or may be missing entirely.

One very popular wheel is the "business" BOLD PS. Fifteen spokes are either in the wrong place or are totally different from a standard "computer" wheel such as the TITAN 10. Figure three shows us the differences between the Apple or other keyboard symbols, and these two wheels.

Figure 3 Not all daisywheel petals are the same, nor are they always in the same spoke position. Here are the key differences between two popular daisywheels.

APPLE	TITAN 10	BOLD PS
[	[	©
]	]	°
{	{	¶
}	}	§
<	<	[
>	>	=
^	^	!
!	!	|
\	\	<
`	`	>
|	|	®
~	~	†
@	@	TM
[esc] Y	¢	@
[esc] Z	'	]

As you can see, the TITAN 10 closely follows a standard keyboard. On the BOLD PS wheel, eight spokes are in the wrong position, and seven more are wildly different.

The usual way to "rearrange" daisywheel spokes is to do a search-and-replace with your word processor, just before printing. I have some WPL based solutions on this if you need them.

Note that there are two "problem" spokes on any 96 petal daisywheel element. Since there are only 96 printable ASCII characters, and since space and delete are needed for their own uses, you end up two codes shy of 96.

Thus, there are two "hidden" spokes on most daisywheel elements. The Diablo way of accessing these is with an imbedded "[esc]-Y" for the one petal and an "[esc]-Z" for the other.

On the TITAN 10, the two hidden spokes are the cents and the closing single quote. On the BOLD PS wheel, they are the "@" and the closing bracket.

Changing the subject slightly, customized daisywheel elements are not all that expensive, especially if you only need a single special character or two. *Camwil* has a special process that breaks off one petal of a stock wheel and replaces it with your stock symbol.

Where's Enhance II?

Would you believe at your local bookstore or computer store?

My *Enhancing Your Apple II*, Volume II (SAMS #22425) is at long last in print. You can get one now either locally or directly through the 1-800-428-SAMS order line.

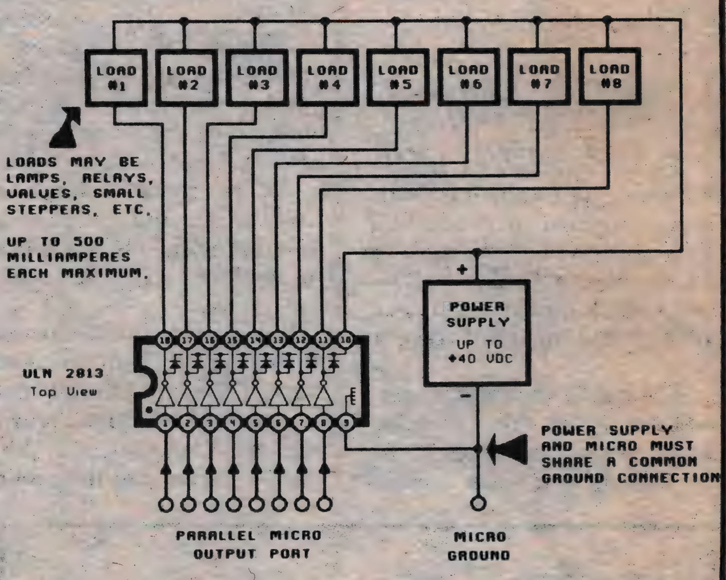
What's in it? Unconditional and absolute reset for the IIe, Superb print quality techniques for word processors, a *Castle Wolfenstein* playing aides set, a brand new and "pure" software VAPORLOCK exact field sync, more on the "tearing method" of quickly analyzing unknown machine language code, and a complete disassembly script of Applewriter IIe.

The usual companion diskettes are also available.

Show Me a Tough Integrated Circuit Power Driver

O.K. Figure four shows one

Continued on page 192


LOAD #1
LOAD #2
LOAD #3
LOAD #4
LOAD #5
LOAD #6
LOAD #7
LOAD #8
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UP TO 500 MILLIAMPERES EACH MAXIMUM.
ULN 2813
Top View
18 17 16 15 14 13 12 11 10
1 2 3 4 5 6 7 8 9
+
POWER SUPPLY
UP TO +40 VDC
-
POWER SUPPLY AND MICRO MUST SHARE A COMMON GROUND CONNECTION
PARALLEL MICRO OUTPUT PORT
MICRO GROUND

Figure four - This tough octal output driver circuit is well suited for "medium power" loads that need up to half an ampere each.

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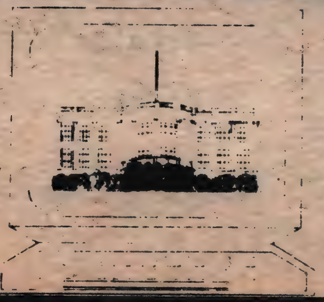

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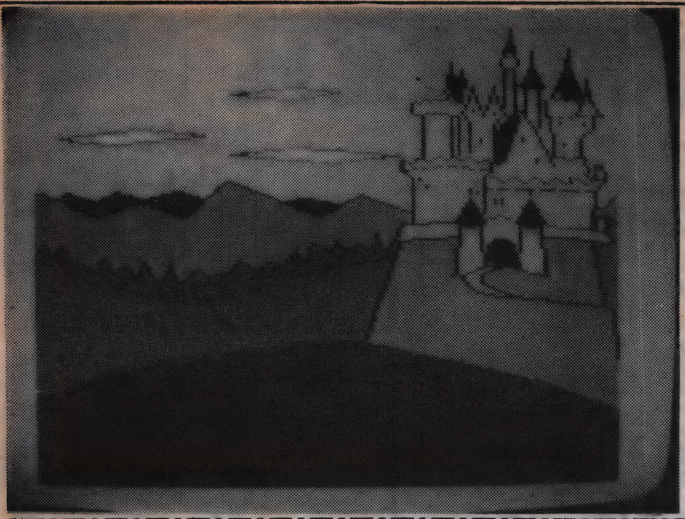

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Koala Stuff
Continued from page 97

OOPS command. And before making major changes, it's usually a good idea to save your picture to disk.

Another good feature is the copy command. This lets you mark a block on the pad by indicating the upper left corner and the lower right corner. You can then move the cursor anywhere on the pad and "stamp" the copy there by pressing one of the top buttons. You can continue making stamps until you return to the main menu.

KP also allows you to deal with two pictures at the same time. The swap function lets you go back and forth between the two at will. By using swap and copy together, it's possible to take a section out of one picture and use it in a new picture. There are a few limitations to using this function, but it is still a very nice feature.

If you are copying a section from an already drawn picture to another, the incoming block will totally overwrite the old picture. This makes it difficult to take a part of one animal and graft it to another, for instance. It works fabulously for putting foreground characters into a new background, however.

The KP disk comes with some great examples for using this feature. Background screens of a jungle scene, a farmyard and a castle can be overwritten with graphics of jungle animals and birds, barn yard residents, knights fighting dragons, or various trees and flowers. One file on the disk contains an alphabet complete with arrows and punctuation marks. (See photos of castle and alphabet.)

Although both programs have a magnifying feature, KP's ZOOM command is a bit nicer. You enter ZOOM mode and return to your drawing. Placing the cursor in the area you wish to enlarge, you hit one of the buttons on the pad. The area is enlarged on the bottom of the screen, while the part and the surrounding area of the drawing remains at the top of the screen in its original size.

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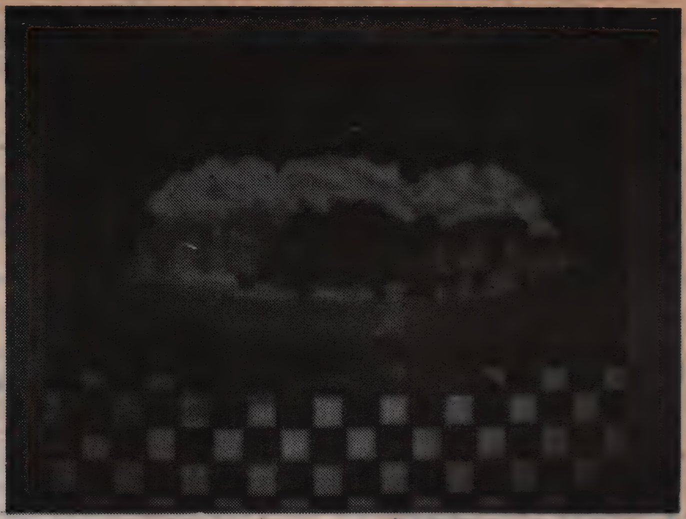

As you color in the boxes in the ZOOM area, the corresponding pixels are filled in the life size version, so you can see how your finished product will look. In addition, a palette at the very bottom will let you change your drawing color without having to go back to the main menu. This makes KP extremely nice.

Like Micro Illustrator, the Koala Printer program is separate from the drawing program. Unlike MI, whose print program comes on the same disk, you must buy Koala Printer for an additional fee. This slight drawback is not without its brighter side. Where Sketch Printer will only work with a Commodore printer, Koala Printer (KPr) works with most of the major manufacturer's printer; Epson, Gemini, Okidata, C. Itoh and

Continued on page 183

Box 1:Comparison of Features

Koala Painter	Micro Illustrator	Feature
Y	Y	Draw
Y	Y	Frame
Y	Y	Box
Y	Y	Circle
Y	Y	Disc
Y	Y	Line
Y	Y	Lines
Y	Y	Rays
Y	Y	Mirror
Y	Y	Storage
Y	Y	Magnify/Zoom
Y	Y	Fill
Y	Y	Erase
Y	Y	Oops
N	Y	Copy
N	Y	Swap
N	Y	X-Color
Y	N	Point

# of Brushes

Koala Painter	Micro Illustrator
8	10

Koala Stuff

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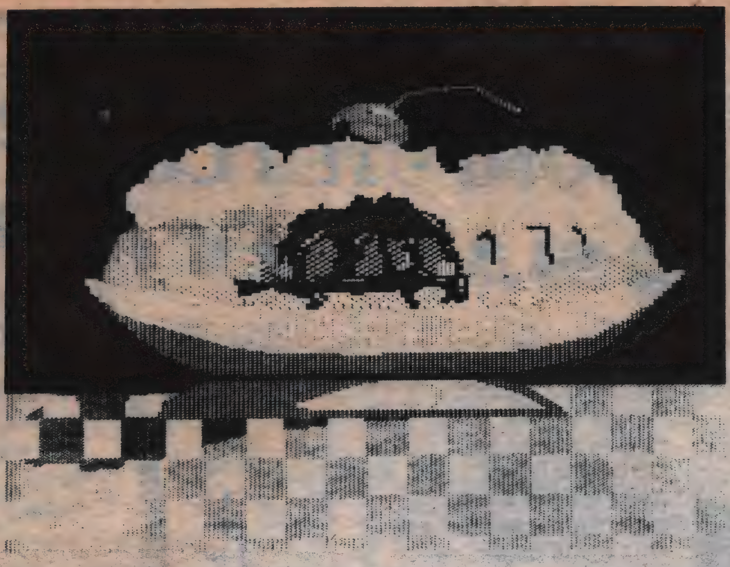

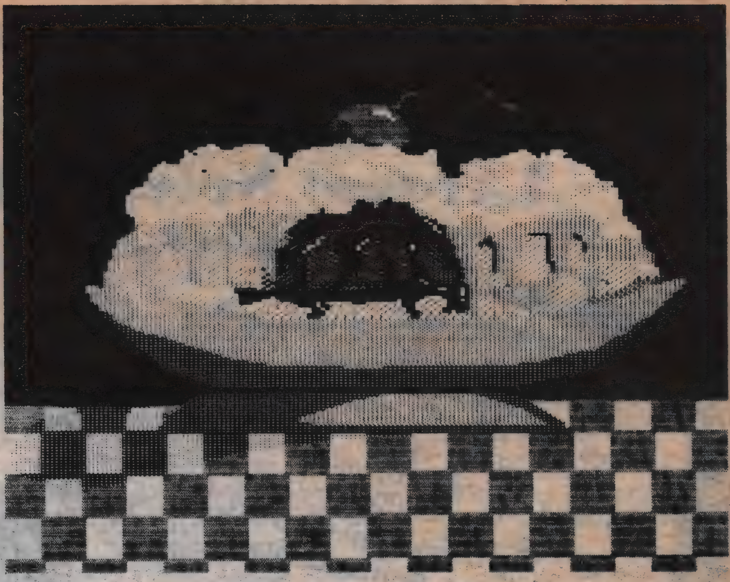

all three Commodore printers. You'll need a BUS CARD, Cardco Card/? A or Card/? + G or The Connection printer interface for printers other than the Commodores.

Like the KP program, KPr is also menu driven. Once loaded, you can shove the Commodore's normal keyboard out of the way. (See menu picture.)

Pointing to the directory disk and pressing one of the pd's top buttons will call up the directory of files on the disk. If you want to use a disk other than the KPr disk, just swap in the new disk before calling the directory. You can swap disks as many times as you like, as long as you load in the new directory each time.

To load in a file, you point to its name and hit the button; then pick the load command at the bottom of the screen. If you change your mind about loading in a file, there's an option to return to the main menu, as well. After loading, the program takes you back to the main menu, where you can display the picture to be sure you've got the right one or adjust the shading before printing it out.

There are three samples on the KPr disk; sundae, tiger and burger. (See photo and two sample printouts of sundae.) When you choose the printer option, a list of options appears. These are the names of the printers followed by either high or low resolution. This means there are two print options for each type of printer.

The high resolution printouts are larger (about 8 by 10 inches). The low resolution printouts are about half that.

The last feature on the menu, shading, is a very useful and well designed option. In order to create a printout, each color must be assigned a pin arrangement that fires when that color is encountered in a picture. Since there are only so many pin arrangements available, some of the colors are almost indistinguishable from each other. If, in your drawing, two of these colors are next to each other much of the resolution will be lost.

KPr's shading option will let you change the pixel arrangement for any of the colors. In my original unicorn head picture, I used light green for the background and light blue for the unicorn's body. When I printed the picture up, it was difficult to distinguish the two colors. (See Printout A.)

Using the shading option, I went in and changed the pixel configuration for light green. KPr first needs to know which color you want to change. It then presents a picture of the dot configuration for that color. By pointing to the dots in the picture and hitting the pad's buttons, you turn the pixels on or off.

There is even an option to look at your picture and have all areas of the chosen color blink, so you can tell what you are changing. In my picture, I changed the light green to white. (See Printout B.) This brought out the unicorn just fine.

However, I wasn't satisfied with the gray in the beard and mane. It wasn't dark enough to really make a difference in the high resolution printout. So, I again went in and changed the pixel configuration. (See Print out C.) This really improved

Continued on page 185

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Koala Stuff

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things.

In fact, I like the changes so much that I went into Koala Painter and changed them using the X-Color command. This is why the photo has white background and dark gray highlights in mane and beard. (See Unicorn Photo.)

As you can see, I enjoyed using the pad and programs enough to actually spend a good deal of time playing with them. With the features in the Paint and Printer programs combined, this is an excellent package. Even so, I would hesitate to pay $125 just to play around with it. At the discounted prices though, its a good deal BECAUSE there are lots of other programs available from Koala and third party vendors that work with the pad.

So far, most of the programs are aimed at young users; Koalagrams Spelling One, Spider Eater, Coloring Series 1 and 2, Dancing Bear, Paint-A-Rhyme and LOGO Design Master. With the Instant Programmer's Guide and Programmer's Toolkit programs available though, I'm sure more software will be forth coming. One vendor is marketing a drawing program that they say will work with anyone's input device (joystick, light pen or graphics pad).

Conclusion

All in all, I think this is a good package. My two year old had no trouble using it, although she doesn't yet understand the advanced features. My 52 year old mother, who is an artist, also enjoyed using the program and was surprised that it "was easier than a pen and pencil, but the printout lacks finesse." She was much happier to look at the screen picture. My sister, 26, thought it was just OK. And my husband wanted to know when he could get an electronic template file, so he could start drawing printed circuit boards with it. I told him to use ZOOM mode and draw his own, but he can be really lazy sometimes, (especially when he has to fight the four of us to get time on the computer).

And I look forward to having enough time to sit down and really create some masterpieces. Of course, first I need to learn how to draw.

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Inside The VIC-20

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driving power to enable them to drive external peripheral circuits. Buffering is necessary because the CPU lines alone don't have the electronic "oomph" to do much more than read and write to memory adresses. The CPU lines could never drive a Centronics interface directly.

In addition to providing data ports, both I/O chips have several other "bells and whistles" in them, including programmable timer circuits that are very useful. Each CIA has a built-in real time clock with a programmable alarm. We won't be using that for our Centronics interface, but it has some interesting possibilities!

Finding Out the Details

Both the Programmer's Reference Guides for VIC-20 and C-64 have sections on these chips. I suggest that you start there for more information on the inner workings of each chip and how they are implemented on the respective computers. The VIC Guide describes the 6522 starting on page 218. The 64 guide discusses the User Port on pages 359-362, and then gives a technical analysis of the 6526 in Appendix M. There are several other sources of information on the VIA. The 6522 has been around for some time, as are chips like the 6520 PIA (Peripheral Interface Adapter) and the 6532 RIOT (Ram, I/O, Timer). There have been several books written on how to program the 6520 and 6522 that are general in nature. One is "6502 Applications" by Rodney Zaks. This whole book is dedicated to programming the 6522 and related chips. It is very thorough and technical, but gives a good understanding of how the chips work. Lance Levanthal in his excellent book "6502 Assembly Language" also devotes a chapter to programming the 6522 and gives some typical applications.

The 6526, on the other hand, is not as well documented. The CIA is, as you might suspect, a later development and is basically an expanded VIA. Much of the programming involved is universal to both. Since it's a much newer chip and has never been "second sourced", it's currently used only by Commodore. Yet, it is conceptually similar to the VIA with some additions and extra features. The best source of technical information on the CIA is the 64 Programmer's Reference Guide. Appexdix M is the manufacturer's data sheet on the 6526 and it provides a lot of insight as to how it functions.

The User Port and The IA Chips

Each VIA or CIA provides two 8-bit parallel I/O ports (in addition to some other I/O lines). Each computer has 2 IA chips, so that's a total of 4 parallel ports. In both the VIC and 64, though, 3 of the 4 ports

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```
INIT  LDA #%11111111   ;Initialize the Port B DDR.

    STA DDRB           ;Set All lines to output (high).

    ;

    LDA PCR            ;Initialize the PCR.

   AND #%00001111   ;Clear all Port B PCR bits (CA1=neg.trans.)

   ORA #%10100000   ;Set CB2 to Auto-pulse mode.

   STA PCR

   ;

   LDA #%00010000   ;Intialize the IER (Interrupt Enable Reg.)

   STA IER          ;Clear the CB1 interrupt flag.

                    ;(Disable CB1 interrupt).

   .END
```

```
INIT    LDA #%11111111   ;Initialize the Port B DDR.

        STA DDRB         ;Set All lines to output (high).

        ;

        ;No need to initialize PC for Strobe.

        ;The 6526 uses it in an Auto-pulse mode all the time.

        ;

        LDA #%00010000   ;Initialize the ICR.

        STA ICR          ; Clear FLAG interrupt flag.

                         ;(Disable FLAG interrupt).

        .END
```

```
SEND    PHA                 ;Character to send is in A.  Save it on stack.

        ;

WAIT    LDA  #%00010000 ;Test for CB1 or FLAG interrupt flag.

        AND  IFR            ;(AND with ICR for CIA.)

        BEQ  WAIT           ;Wait for interrupt flag to go high.

        ;

        PLA                 ;Get the original byte off the stack

        STA  ORB            ;Send the byte out Port B register

                            ; (PDRB for CIA.)

        .END
```

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Inside The VIC-20

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are already dedicated to an I/O task like handling the keyboard, serial bus, or joystick connectors. One port, however, is not dedicated for use by the computer. Instead, it is connected to a 12/24 position edge connector on the main PC board. This is the "User Port".

What is the "User Port?" Well, Commodore left that for you to decide. That's why it's called the "User Port". They merely provided the hardware (and the software for an RS-232 interface, if you desire). The rest is up to you. This is the closest Commodore has ever gotten to an "open bus". It is not as flexible as some "open bus" computers, but it's cheaper to implement because you don't need to buy much extra hardware! Software can configure that 8-bit port into many different things. We'll be seeing how to turn it into the Centronics parallel interface that Commodore forgot to put on.

Inside the Chips - A Register Map

Each VIA or CIA chips have 16 internal registers that are accessed by the CPU as though they were 16 continuous memory locations somewhere in RAM. This is because the 6502 and 6510 series of microprocessors use memory-mapped I/O. We saw how this worked with the 6567 VIC II chips in an earlier article. If you still can't understand how this works, just insert the words "memory location" everytime you see the word "register". For the purposes of the IA chips, they are interchangeable. This may make the concept clearer to you if you are having some trouble with it.

The VIA that is connected to the User Port on the VIC 20 is called "VIA # 1" and is addressed at $9110 - 911F. Then User Port CIA on the 64 is "CIA # 2" and is addressed at $DDOO - DDOF.

In order to use the chips, you have to initialize them by loading specified values into certain registers. You then read or write data to and from the data ports. You may also use the interrupt facilities or clock/timer circuits to make your I/O operations more complex.

For our Centronics parallel port, we only need to look at the registers that are connected to "Port B" since that is the User Port. We will have to 1) initialize the Data Direction Register (DDRB) 2) decide how to handle handshaking and initialize those features. Then all we have to do is send data to Peripheral Data Register B (PDRB) and do the handshaking.

Initializing the Chips

Normally, the IA chips are set to some default values at power-up time by the KERNAL initialization routine. All the ports of the IA chips connected to the keyboard and serial bus are initialized. The user Port is not initialized for output, so we will have to do it ourself. You normally want to re-initialize it anyway, since you may not know what its previous contents were before your program was running.

The data lines of the data registers can either be input or output lines, but they cannot be both at once. You must tell the chip whether you want the lines to be input or output lines by setting or clearing the appropriate bits in the Data Direction Registers (DDRs). The DDRB is another 8-bit register. Each bit location in the DDR corresponds to a bit in the Peripheral Data Register (PDR). If we set bit # O high ("1") in DDRB, then bit # O in PDRB will become an input line. If we set it low, it will be an output line. It's the same for all the other bits in DDRB and PDRB. (Part A has its own DDR and PDR that works the same way.)

You can independently set any of the 8-bits of a data port to be an input or output line. This gives us some added flexibility. For example, we could set bits 0-3 high and bits 4-7 low. This would give us a 4-bit input port and a 4-bit output port from a single 8-bit port.

For our Centronics port, however, we want to set Port B to be an ouput port on all 8 lines. To do this, we have to load the Data Direction Register for Port B (DDRB) with the correct value (%11111111 or $FF).

Handshaking With Mr. Chips

In addition to setting up the DDR for output lines, we have to initialize the IA chips to do the proper handshaking for us. Fortunately, they have a lot of built-in circuitry that makes it easy for us.

"Handshaking" is the term used to describe the process of co-ordinating data transfer from the computer to the peripheral. The Centronics interface defines several handshaking signals that can accompany the 8-bit data signals. Each of these handshaking signals is sent over a separate wire and is not part of the 8-bit transfer. At a minimum, we need two additional lines for a successful printer implementation. Those two lines are 1) Data Strobe and 2) Data Acknowledge.

When we write a data byte to the output port, we must somehow tell the printer that a byte is in the register for it. We do this by pulsing a STROBE line low for a clock cycle or two. The low signal on the Strobe line tells the printer that it is o.k. to get a new byte from the 8-bit data lines connected to our User Port. This is hald the job of handshaking.

The remaining problem is how to find out if the printer is ready for a new data byte to be sent. We can send characters to the printer much faster than it can print them. We could send several hundred thousand characters per second to the printer, but even the fastest dot matrix printers could only print a few hundred per second. The rest of the characters would be lost and a "data overflow" would occur. So, we need some way for the printer to tell us when it is ready to handle a new character so we won't lose data.

The ACKNOWLEDGE line is the line of communication back from the printer to the computer. When the printer buffer is "full" of characters

Continued on page 188

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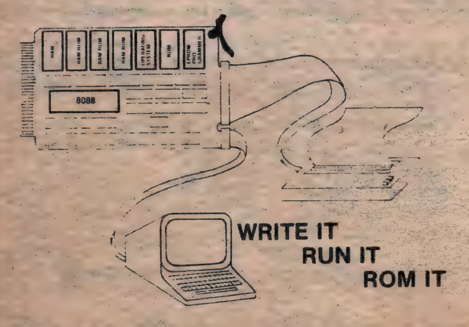

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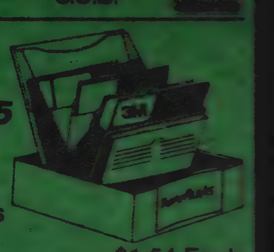

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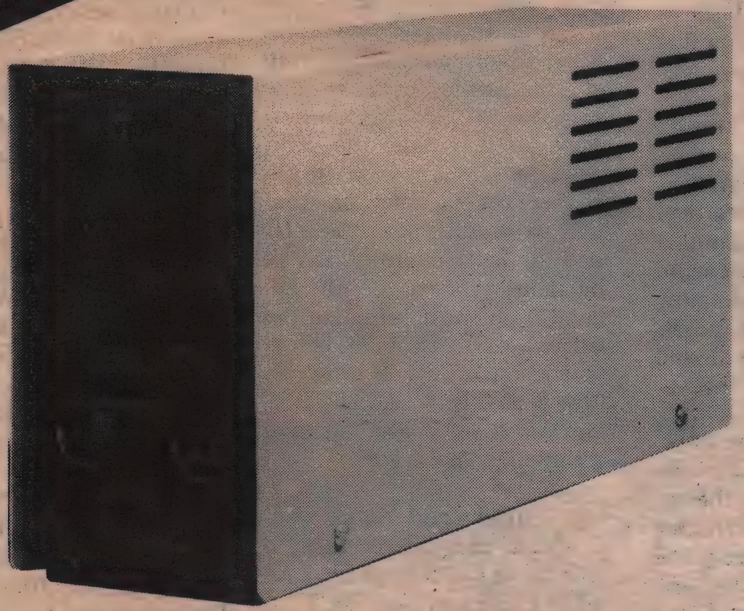

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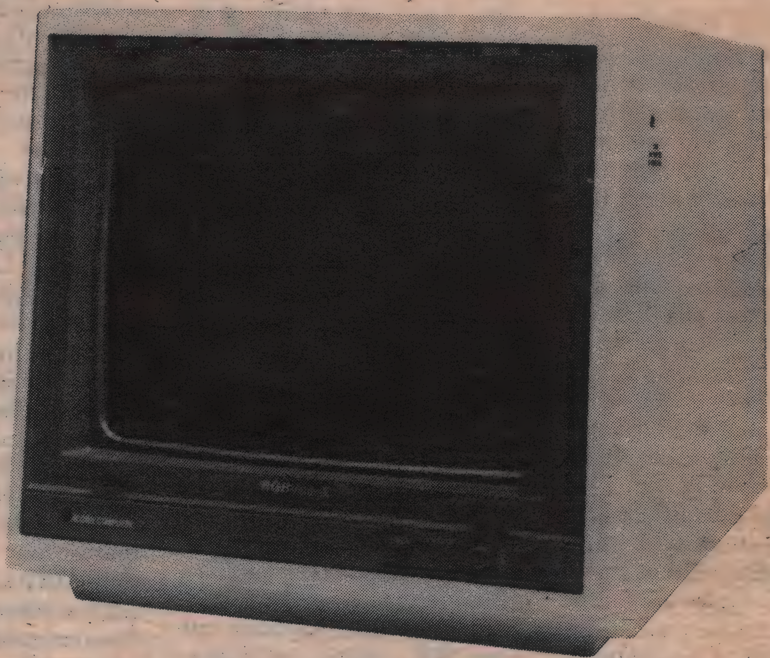

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Inside The VIC-20

Continued from page 186

and can't accept anymore for printing, the Acknowledge line will be set high. When the printer is ready to accept more data, it will put the "Ack" line low. We can set our IA chip to test for the "low transition" that will occur when the printer says, "O.K., I'm ready for more characters." Then we can send some more. If the "ACK" line is still high, we know that we have to wait awhile for the printer to catch up.

We can't use Port B to implement these handshake lines since they are already tied-up with the data transfer. What can we do? Well, the good news is that the IA chips have some extra lines on them that are specially designed to facilitate this type of handshaking. They are the CB1 and CB2 lines on the VIA. The PC and FLAG lines work similarly on the CIA.

On the Via, we can set up the chip so that the CB2 line pulses low for one cycle after a byte is written to Port B. That takes care of our STROBE line. The PC line on the CIA works the same way. (Although, in the Centronics interface for the 64 we will actually use a different method. (I'll explain the reason why next month.)

To implement the ACKNOWLEDGE line, we will have to find a line that is an **input** and can detect a low transition from the printer. The CB1 line on the VIA does this for us. On the CIA, the FLAG line works just like the CB1. We can then check the Interrupt Flag Register (IFR) or Interrupt Control Register (ICR) of each chip and "see" when a low transition occurs. This implements the second half of our handshaking strategy.

Initializing the Handshake Lines

In order to use the CB1, CB2, and FLAG lines in the manner described, we have to initialize the proper control registers in the VIA or CIA (the PC line doesn't need any additional initialization). In the VIA, we have to set the proper values in the Peripheral Control Register (PCR). The proper bit patterns are fully described in the VIC Programmer's Guide or one of the other books I previously mentioned. We will want to set the CB2 line to the "pulse output mode". We'll set the CB1 line to set its interrupt flag on a negative transition.

Sending Data Out The Port

Once we have done the initialization, we can send data to the printer through our interface. We use a simple algorithim (routine) to implement the handshake and that's all there is to it.

In order to demonstrate just how all this works a little better, I'm going to include a couple of short Assembly Language routines to set the VIA and CIA up. Next month, I'll give you the full Assembly Source Code to the printer driver routines for both the VIC and 64.

Here's How It's Done

First, let's initialize the VIA chip:

Please put program in here.

(The proper addresses for the VIA labels (DDRB, PCR, and IER) can be determined from the register maps.)

Now, let's initialize the CIA:

Please put 2nd program in here.

Notice in the above examples, we didn't have to initialize the PC line of the CIA. It's dedicated to pulse low on output to Port B and can't be changed. Also, we disabled the interrupt flags of both CB1 and the FLAG lines. This is because although we are using the lines for input flags, we don't want interrupts generated for our simple printer driver. Instead, we are polling the flag registers. Later, we could add interrupt capability, but at this point it is an added complication which is best avoided. Now that we've initialized the chips, let's see a routine that will send our characters out the port using handshaking:

Please put 3rd program here.

As you can see, with the power of the IA chips, the actual output routine is rather simple. This is the heart of the software/hardware interface. Of course the full print driver routine is much more complex. It can include PETSCII/ASCII conversion routines, graphics routines, printer buffers, and all kinds of complications. The routine that we'll be using is not that complex, but it does include some niceties that make this interface more interesting.

More to Come!

Next month I'll present the full assembler listings of the print drivers for the Centronics interface. Hopefully, I'll be able to present versions for both the VIC and the 64. They will be written in standard Commodore Assembly Language and you shouldn't have much trouble converting them to another assembler if you want to.

Also, I'll be explaining why we aren't using the PC line of the CIA in the 64 version of the driver. Instead we are using the PA2 line, which is available to us on the User Port. Some of you "hot dogs" out there see if you can figure out why I did it that way. It might be something to keep you out of trouble for a while!

Errata, Apologies, Comments, etc.

I need to make some comments about the BASIC listing of the print driver routine printed in April's column. First, as it stands, the print driver only works with the 64. I'm working on a new one that will work with both the VIC and the 64. Hopefully, it will be done by next month. Second, you must initialize the driver by "SYS 12*4096" before you can use it! If you hit "RUN-STOP / RESTORE" you will have to "SYS" again to reinitialize the driver.

Important Note

Third, forget everything I said about OPENing a file with a file # greater than 128. That doesn't work. Instead, OPEN the driver with a Second address greater than zero (e.g. "OPEN 2,2,2"). That will tack on an extra line-feed to every carriage return. Of course, if your printer can do automatic LFs after CRs, use the feature instead.

Fourth, and most importantly, there were several lines ommitted from the listing last month. Somehow they didn't get in the printed listing (magazines are only human, too!). The missing lines are as follows:

```
122 DATA 243, 165, 186

124 DATA 201, 2, 240

126 DATA 3, 76, 91, 242

128 DATA 133, 154, 24
```

I'm sorry if this caused you any inconvenience. Next month we'll have a whole new printer program to use. It will have more features than this one. This program is sort of a "stop gap" measure, but it will let you get some printout through your new interface for now. Also, you can use EasyScript for printout since it works with the interface.

In the January issue, I mentioned a new integrated software package that I eroneously called "HomeWork". The proper name is "HomePak" and it is distributed by Bateries Included. The suggested list is $49.95, not $59.95. "HomePak" is an integrated wordprocessor, communications program, and datamanager (I think). I mentioned it because it had received glowing reviews from Infoworld. Since they have been very unimpressed with the 64 in general, I thought their endorsement of the product was significant.

I was wrong. "HomePak" appears to have some flaws that make it less than the bargain it seems. Until I see the package run for myself, I will refrain from further comment. In any case, I recommend that you try it beffore you buy it if possible.

Goodbye Plus/4, Hello C-128 (and a lot of speculation)

If you remember, a few months back I told you 64 owners that Commodore wouldn't forget you. I thought that the 64 would be in production for another year or two at least and then be replaced

Continued on page 189

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Inside The VIC-20

Continued from page 188

with the Plus/4 and Amiga. I was wrong. Commodore had a lot better plan than that up their sleeve; the new C-128!

You might think I'm a little bit enthusiastic about this machine, but I'm not. I'm a whole lot enthusiastic about it! Let me know when you see one for sale so I can send my money and get one, too. I'm ready for mine today (in fact, I've been ready for about six months).

You see, when it comes to serious business/productibity use, the 64 has three main problems as I see it:

1) Lack of 80 column display mode.
2) Ridiculously slow disk drive.
3) Small capacity of floppies.

Oh, I know that you can "fix" your 64 to "patch-up" its problems. You can add an "somebody's" 80 column board (that doesn't work with anybody else's software) or use an 80 column emulator program (and say goodbye to readable text). You can add on "somebody else's" parallel disk drive (that doesn't work with much software either). And you can use the 8050 or 8250 disk drives to upgrade the capacity (but you can't read or write to your old 1541 disks anymore). After you have patched together this "frankenstein" of a 64 you have $1000+ computer that is compatible with little if any commerical software. This has been a discouragement to those of us who have wanted a more powerful version of the 64 that we could upgrade to.

The Plus/4 solves little or none of these problems. It suffers from just about all of the 64's limitations and has few advantages of its own. That is why most of use were so disappointed to see it being promoted as the 64's successor.

Well. that's all changed for the better! Now Commodore is offering a computer that is more than a worthy successor to the 64. It is a powerful computer in its own right, period!

For starters, the C-128 has:

1) Built-in 40/80 column color display hardware (RGB or composite).
2) Very fast disk drives (usually 10-50 times faster than a 1541!)
3) Double sided, double density disk drives (360K) that can read and write standard 1541 disks as well as the new format.

In addition to that, it literally has two other computers built-in to it:

4) A built-in Commodore 64 that runs all the 64 software.
5) A built-in Z-80A based CP/M+ 3.0 computer that runs all the standard CP/M software and reads and writes to several different 5.25" floppy disk formats (apparently including IBM, XEROX, Osborne, and KayPro among others).

And if that isn't enough (!):

6) 128K of RAM expandable to 512K.
7) Several expansion ports for serial and external devices (runs all the VIC/64 peripherals including disks, modems, and printers).
8) A really nice keyboard that is laid out like the 64, but adds new features and a numeric pad.
9) The best BASIC interpreter (v. 7.0) that Commodore has ever released. Jim Gracely said it was like having Simon's BASIC, the Super Expander, and BASIC 4.0 all rolled into one (with MicroMan thrown in for good measure!)

The list price is rumored to be as low as $300 for this machine. To me it's like Commodore is saying "Buy our new C-128 computer and we'll throw in a C-64 and a KayPro for free!" The C-128 is really three computers in one.

Of course, I will be very surprised if we don't see Apple and IBM emulator add-ons available very shortly for the C-128. When this happens, you may own a machine that runs Commodore 64, CP/M, Apple, MS-DOS/IBM software in addition to its own! Of course with the amount of 64 and CP/M software already available (6,000+ programs at last count), most 128 owners will have little need for Apple or IBM software for quite a while!

The quicker the 128 shows up, the better. The 128 is a system that will find its strongest market in 1984-1986. Beyond that, it will face a lot of stiff competition from new and faster computers coming on the market (including Commodore's own Amiga). The market is ripe for this computer now. I don't know what will happen it Commodore waits 6 months to get it to market (like they did with the "Plus/4"). It may be that by the time it appear, the Macintosh - Amiga - Atari/ST wars will be in full swing. Let's hope it's out soon!

The price seems to be o.k., but I'm not sure. If the 128 sells for $300 and the drives and new monitor are priced along the lines of the 64's peripherals, then a complete system will run well under $1000. This will make the 128 a very competitive machine. If Commodore can package a system for around $750 with a monochrome monitor and some software, then it will be a killer. If prices are significantly higher than this, there will be a problem establishing the 128 since it has some strong competition at the $1000-$1500 level. Remember, most people are going to associate the 128 with the "games and recreation" of the 64. Commodore will have to "buy" its share of the low end business market with lower prices just like KayPro and Sanyo have done.

The lack of IBM/MS-DOS compatibility, which is a distinct marketing disadvantage, is not really the problem it seems to be. If the C-128 had an 8088 microprocessor built-in instead of a Z-80 it could conceivably run a butchered-up version of MS-DOS and claimed some kind of ridiculous IBM compatibility. Of course, most of the best IBM-PC programs won't run on a system like this, but some would and that's enough for the marketing department to build some hype on. I think you're going to see a lot of machines like that on the market in the near future. Commodore appears to have wisely left the door open for third parties to provide this capability for the 128.

Instead, Commodore chose

Continued on page 190

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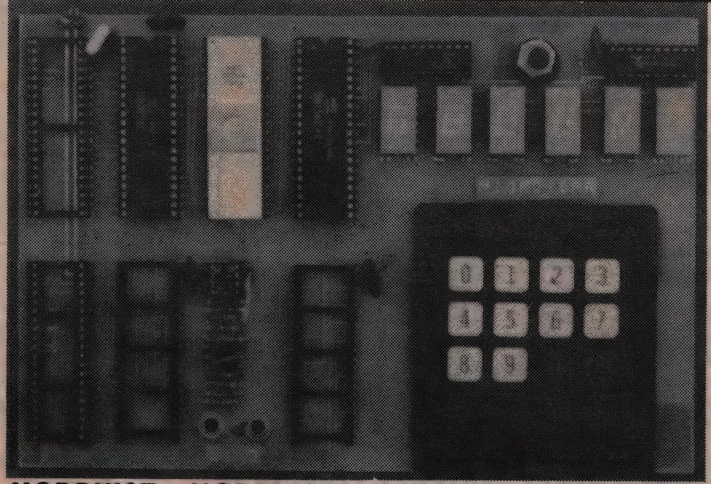

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Inside The VIC-20
Continued from page 189

to open up the huge base of CP/M software to the C-128. By offering CP/M instead of MS-DOS Commodore may have lost some marketing hype, but they have increased the realistic software base of the machine by several magnitudes. Unlike MS-DOS, CP/M software is really less machine dependent and much more adaptable to different computers. It will be little problem to convert several Magabytes of programs over to the 128 (if they need to be converted at all)!

The 128 gives a real advantage to owners by supporting the cheaper CP/M software with its huge (100 Mbytes + !) public domain library. Access to this alone is worth the price of a 128. By choosing to support CP/M instead of MS-DOS, Commodore will be able to deliver a much larger real base of software for the computer on the day that it is first sold than any system ever introduced!

Some of you who have sent me letter the past few months are probably wondering if you will ever get an answer back. You will! I'll be doing my best to get back with you within the next few weeks if you haven't heard already. Many of you just wrote to comment on the series or make general comments, and for that I thank you. Others, with more specific questions or comments, will receive some kind of response from me, but it will probably not be anything elaborate. In upcoming columns, I will share several of the best letters and comments so you can get an idea of what other Commodore owners are thinking and saying.

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Book: "6502 Assembly Language"
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Published by:
Osborne/McGraw-Hill
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Book: "Inside Commodore DOS"
by Richard Immers
Order from:
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Chatsworth, CA 91311-6152
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Book: "1541 Maintenance Manual" or "1541 Maintenance Guide"
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Scroll Up/Scroll Down
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Fill/Justify
Print

File Commands
Directory (with wild cards)
Show File/Help File
Input/Output File
Delete File/Save File

Other Commands
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Cost & Value
Continued from page 48

User Evaluation

Rather than try to speak for the "average" user (whatever that means!), this evaluation is from my own perspective. I have substantial training in financial analysis, use my computer regularly for everything from spreadsheets to BBS's, and understand the basic workings of the tax code and my personal retirement system. This package is very up-to-date, containing changes to make it compatible with the 1984 tax rules which apply to retirement funds. It is simple to use and produces numbers very quickly, but it will require some knowledge of basic investments and finances to be of value to those who purchase it. The documentation provided with the program is very thorough, but it is written in the form of a college business text book. In my experience, that will discourage many who might otherwise benefit from the simple and powerful tools which can "simulate" your financial future under a variety of conditions which you specify.

The casual user will not gain much from this program without spending some time studying the booklet, and the author acknowledges that in the Introduction. If you are interested in games, simple utilities, or minimum reading programs, this package will likely not serve your needs. If you are a student in finance, a taxpayer who wants to develop his own understanding of the pros and cons of investment

Continued on page 191

Cost & Value

Continued from page 190

choices, or someone who deals in investments professionally (for example, a broker), this package provides tremendous insight, great flexibility, and a structured approach to understanding the variables and alternatives of investing for retirement. Furthermore, with a little imagination, it can be adapted to do calculations for a whole series of pay-in/pay-out problems, present-value analyses, and simulations of what happens under a variety of inflation, tax, and interest situations.

Summary Rating

Based on a five point subjective evaluation system, this program scores 74 out of a possible 100, as follows:

1. Performs as advertised: 20
2. Quality of Documentation: 18
3. Ease of Learning: 5
4. Ease of Use: 15
5. Cost-for-value received: 16

This score would be substantially higher if the subject were made easier, but the nature of the topic requires either a good background in financial management or an extensive tutorial which is less demanding of the user than the manual used in this approach. Even with this shortcoming, the package is rated a fair buy for the business user and an excellent buy for those dealing professionally in taxes and investments.

One final note for the record: If you took the purchase price of this software and invested it for 20 years at 10% interest compounded annually, you would receive $323 at maturity. Bet you didn't know that and would have trouble finding it out without using this program!!! BYE.

Your Retirement Fund
P.O. Box 1010
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Pamphlet - $8.95
Program disk - $40.00
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```
 VALUE OF A RETIREMENT OR SAVINGS FUND

Basic Data
   1 Earnings contributed annually [$]
? 900
   2 Tax fraction for the earnings con-
tributed [%]
? 0
   3 Annual-yield rate from investment
of the fund [%]
? 7
   4 Tax fraction for the tax paid annu-
ually on the yield [%]
? 0
   5 Tax fraction for the withdrawal [%]

? 20
   6 Annual-inflation rate [%]
? 7
   7 Number of years between the time of
the first contribution and the time of
the withdrawal [yrs]
? 25
   8 Number of years between the present
and the time of the withdrawal [yrs]
? 26


If this is a retirement fund,enter 'y'.
? y
 Key Calculations
  After-tax earnings contributed each
 year
 $ 900
  Amount to which the first contribution
 grows
 $ 4885
  After-tax amount to which the first
 contribution grows
 $ 3908
  Value,in present dollars,of the after-
 tax withdrawal of the amount to which
 the first contribution grows
 $ 673
  Amount to which the fund grows
 $ 60909
  After-tax withdrawal of the fund
 $ 48727
  After-tax withdrawal,in present dol-
 lars,of the fund
 $ 8391
```

Figure 4

```
The menu for Part 3 PAY-OUT PHASE is:

1 MINIMUM WITHDRAWAL AFTER AGE 70.5
2 SPECIAL 10-YEAR AVERAGING
3 INCOME AVERAGING
4 LARGE FUTURE WITHDRAWAL
5 YEARLY TRANSFERS TO SAVINGS FUND
6 1984 Tax Schedules
```

Figure 5

```
   MINIMUM WITHDRAWAL AFTER AGE 70.5

 Basic Data
   1 Amount in the retirement fund at
the beginning of the tax year of inter-
est [$]
? 60000
   2 Life expectancy [yrs]
? 15
   3 Yield rate for investment of the
fund in the tax year of interest [%]
? 7

 Key Calculations
  Amount in the fund before the with-
 drawal at the end of the tax year of
 interest
 $ 64200
  Minimun required withdrawal in the tax
 year of interest
 $ 4000
  Amount in the fund after the withdraw-
 al at the end of the tax year of inter-
 est
 $ 60200
```

Figure 6

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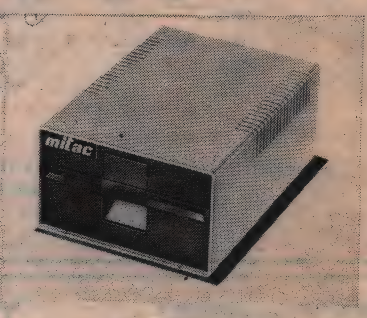

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Ask The Guru

Continued from page 180

of my favorite interfaces, the *Sprague* ULN 2813. This beauty has eight separate drivers in it that can handle an amp each at up to forty volts, complete with internal spike protecting diodes. It is easily driven from most any parallel microcomputer port.

Note that the load and the computer must share a common ground connection.

The circuit is best used for "medium power" applications such as driving print hammers, small lamps, solenoids, air valves, large relays, stuff like this.

More details appear in my *Micro Cookbook II* (SAMS #21829).

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I Need A Good Book On Motors For Robotics

How about a great book instead, costing — are you ready for this? — only $3.50?

It is called the *Small Gearmotor Handbook*, and *Bodine* publishes it. See the listing at the end for an address.

No, I didn't write it. It's been around for a long time, but things in the motor world don't exactly happen in the fast lane. Very readable, very solid, and very heavy on fundamentals.

Go for it.

What is a "Forced Return" Option Picker?

It is a powerful way to let a computer jump six ways from Sunday that works especially well with the 6502. Figure five shows details.

There are lots of times and places in a program where you want the code to go to any of a large number of different routines. As examples, a word processor's [S] for save command, or an adventure program discovering that the giant clockwork armadillo is indeed awake and feeling on the mean side.

Routines that let you go to any of a number of different places in a simple and orderly manner are called *option pickers*. They are usually called for if you have to go to six or more different locations, particularly if the selections involve more or less random keystrokes, or wild mixtures of letters and control characters.

The "forced return" theory is elegant, sneaky, and excruciatingly simple. Say you go to a subroutine in a machine language program. The return address of the subroutine gets remembered on the stack, so the program can remember where to go back to. On a subroutine return, the program goes back to whatever called it.

Now for the sneaky part. What if you force a fake subroutine address onto the stack and then call for a return? Instead of going where you came from, you instead go to the new fake address and pick up there.

Figure five shows us a 6502 example. First you decide which option you need as a hex number. Next you *range check* that option to make darn sure you can go where you think you want to. Then you leave the option number in the accumulator.

Next you double the number by doing an accumulator shift left or ASL. Since you need two bytes for an address, any access to an address table will necessarily be double the option value.

Transfer the doubled option number to an index, such as the X register. Then go to a table of addresses. Grab the HIGH address byte and shove it on the stack. Grab the LOW address byte and shove it on the stack. Then RTS.

That simple.

Should you have jumped to the option picker code, you end up jumping to your new address. If, instead, you JSRed to your option picker code as a subroutine, then you end up JSRing to your option.

Important advantages of the method are that it is consistent, regardless of how many options are needed. It is also very

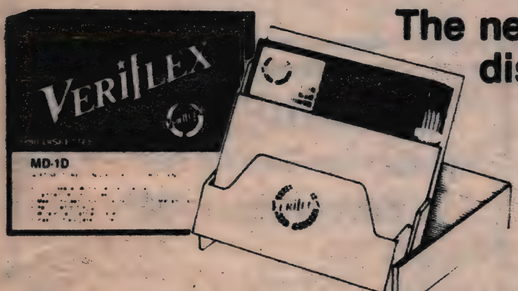
Continued on page 194

Option Picking Using the "FORCED RETURN" method

```
Enter with range-checked option number placed in the
accumulator.  Then . . .

OPICK  ASL  A              ; Double pointer
       TAX                 ;   and move to index
       LDA  ADDFILE,X      ; Get HIGH address byte
       PHA                 ;   and shove on stack
       LDA  ADDFILE+1,X    ; Get LOW address byte
       PHA                 ;   and shove on stack
       RTS                 ; "Return" to option


 Important  Addresses in address file must all be
            ONE LESS THAN intended option address.
```



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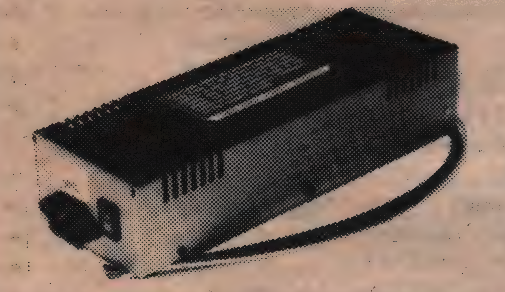

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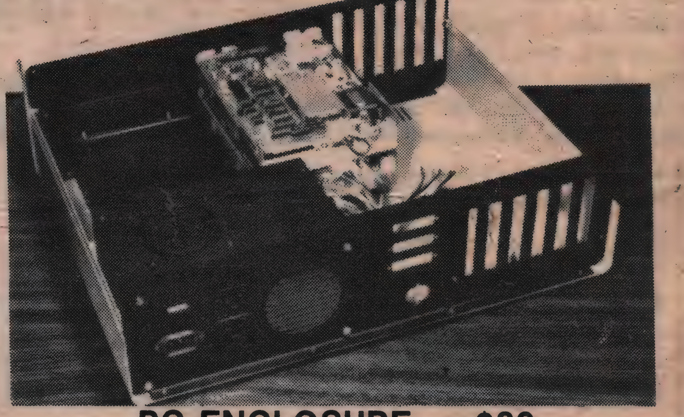

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Ask The Guru

Continued from page 192

fast and very short, particularly when lots of options need to be picked.

The method also gets around a bug in the jump indirect code in early 6502's. This bug presented problems if you ever tried a jump indirect on either of the two top bytes in a page. The forced return method completely eliminates any need for "pure" indirect addressing during option selection. It also asks nothing of page zero.

Two very important gotchas: The addresses MUST get shoved on the stack HIGH BYTE *first* and LOW BYTE *second*. Also, the addresses in the address table must be all ONE LESS THAN the intended addresses. The reason for this is that the RTS on a 6502 goes one beyond the address on the stack when returning from a subroutine.

With the code shown, the addresses go in the table *frontwards*, or high byte first. If you put the addresses in the usual 6502 "position-page" or "low-hi" form, be sure that you end up shoving the page or high byte onto the stack first.

This method is not at all new, and you will find it in the original Apple monitor. It is unique and not well known, though. And it is amazing how many really bad alternatives to option picking end up in use just because this jewel is not well publicized.

More details on this in my *Assembly Cookbook for the Apple II* (SAMS #22332).

And that just about wraps another cut. Write or phone to get in on all the fun. ●

```
****************************************
*                                      *
*         N E E D     H E L P ?        *
*......................................*
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Apple IIC

Continued from page 96

STX-80 Thermal Printer

7 data bits, 1 stop bit, with screen echo, as described above, here's how you could do it in a BASIC program, with a subroutine starting at line 60000:

```
60000 PRINT CHR$(4);
"PR#1": REM * Address
Port # 1 *

60010 PRINT CHR$(9);
"I": REM * Screen Echo *

60020 PRINT CHR$(9);
"8B": REM * 1200 Baud *

60030 PRINT CHR$(9);
"1D": REM * 7 Data 1 Stop *

60040 RETURN
```

A subroutine to return to the screen only could be:

```
65000 PRINT
CHR$(4);"PR#O"

65010 RETURN
```

You can see that using these, or similar, subroutines in a program gives you easy and convenient control of both ports, without user intervention.

The Printer Cable

Fig. 2 shows a cable that will drive a serial printer from either Port # 1 or Port # 2, if the ports are properly configured. This cable is available from Star Micronics printer dealers for $12.95 (a bargain!) as the Apple IIc Serial I/F Cable, Part # 87999320. Although designed to work with Star printers, it works with other serial printers that have a standard DB-25 female input connector and use pin 20 for "handshaking" - telling the computer to stop while the printer catches up. Since printers are inherently slower than computers, hardware handshaking becomes important.

Note: This cable should not be used with a modem. Pins 2 and 3 at the DB-25 end would need to be reversed for modem use, and some modems require additional signals.

If you have a special requirement, such as needing a pin other than pin 20 for handshaking (some printers use 4, or 6, or some combination of pins), then contact Michael R. McCoy at Cord, Ltd. (2815 Junipero Avenue, Suite 102, Signal Hill, CA, 90806. Phone: (213)-595-4446) with your request. Cord Ltd. offers a "standard" Apple IIc printer interface cable with DB-25 pin 4 as the handshake pin, for $34.90 retail, perhaps available for less at one of their printer dealers. They will make custom cables to your requirements.

Using a serial printer with the Apple IIc that requires anything other than the default port settings is a real bother. It appears Apple wants to make it very attractive for you to use only their printers - the Scribe or the Imagewriter. They just plug in and print.

However, I've been able to operate most of my various non-Apple printers with the Apple IIc using one of these approaches:

(1) Use a serial printer that will operate at 9600 baud with an 8-bit word length, 2 stop bits, and no parity for input. Most printer RS-232 serial interfaces have switches that can be set to this format. Port pinouts and a typical printer cable were described in Part 1 of this article.

(2) When using a serial printer that won't operate with the port default settings, temporarily reconfigure the printer port as described in Part 1 of this article, using the keyboard, or a BASIC program. This is not as clumsy as it sounds, and may be required if you need to boot-up with a disk other than the ProDOS-only System Utilities Disk.

(3) Don't use a serial printer at all - use a parallel printer! Since most microcomputer parallel interfaces follow the "Centronics standard", this is usually a lot less trouble than fooling with the many deviations found in RS-232 interfacing. However, this approach requires a special "Serial-To-Parallel Interface".

Serial-To-Parallel Interfaces

I tested five different "Serial-To-Parallel Interfaces" for my book. These devices (called adapters, converters or interfaces) accept the serial input from the Apple IIc (normally, Port # 1) and perform internal electronic wizardry that converts the serial signal so it appears at the output on a 36-pin "Centronics-standard" parallel connector that plugs into your printer's parallel connector. Well, that's the way it's supposed to be.

Continued on page 195

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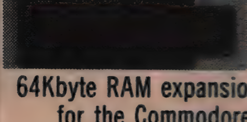

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Apple IIc continued from page 194

Tigertronics
Model 770
Serial / Parallel
Converter

(Photo courtesy Tigertronics, Inc.) Tigertronics Model 770 Serial/Parallel Converter (Model 770-2C includes cable to Apple IIc serial port).

Unfortunately, Apple has (intentionally?) designed their serial output with some unconventional signal quirks that outwit some of these converters when used with some printers.

Each of the tested converters has some features, and lacks others. Table 3 shows the features and results of using these interfaces with four parallel "test" printers.

Understanding the Chart

Table 3 requires a little explanation, since it covers a lot of information in abbreviated form. It should first be understood that the testing of these units took place in late October of 1984. Some of the converters tested were early production models, subject to change. By the time you read this it can be assumed that some of them will be improved in both performance and appearance.

Source and Price

The columns are all numbered. Column 1 provides the manufacturer's name for their product, and the source. Some of these converters are available from local computer dealers.

Column 2 shows the manufacturer's suggested retail price, but local dealers sometimes charge less. Shipping and handling (S & H) charges are shown where specified, but the others may

Continued on page 196

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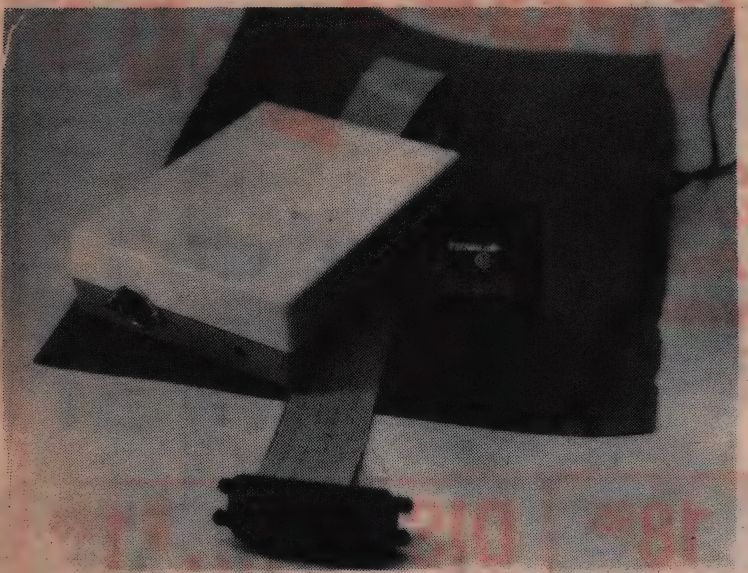
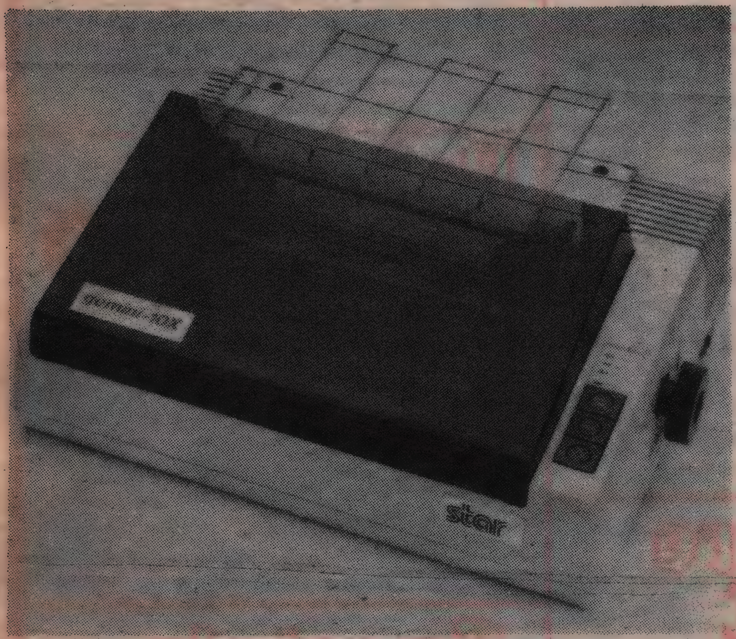
Apple IIc continued from page 195



Technologic Systems SPC-2 converter.



STAR MICRONICS INC.'s GEMINI 10X

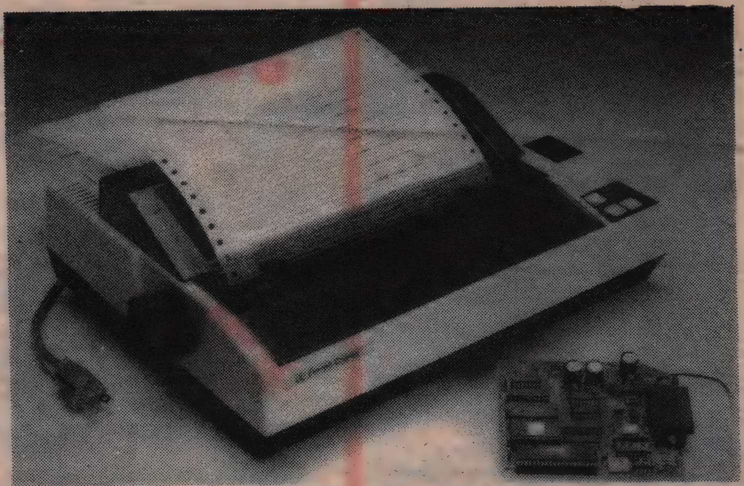
also charge for shipping. Also, with strong competition developing in the area of Apple IIc printer interfaces, prices may change. I suggest you call and check price before ordering.

Features

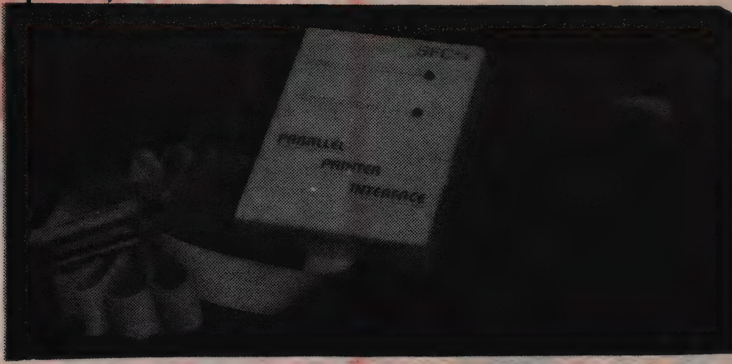
Columns 3 and 4 give the physical size, box material and color. The Belkin and Tigertronics units are the smallest, if space is a problem in your installation. All units were well-made.

Some units are designed to "steal" power from pin no. 18 of a typical Centronics parallel interface, where +5 volts is normally available. However, since some printers do not provide this voltage, most manufacturers have designed their interface converters to use external power at all times. This is done with a wall-plug transformer that is either directly wired into the interface box, or plugs in. Other converters only use external power when needed. Belkin supplies the transformer whether you need it or not, while Tigertronics and CNR charge extra for a special externally-powered version. This information is summarized in Column 5.

Column 6 shows the status of the cable from the converter to the Apple IIc serial port. These cables were all about six feet long. All units shown included the cable, which is either directly-wired, or plugs in, to the converter, except Technologic Systems, which charges extra for the plug-in cable.



Everett/Charles CP-80 dot-matrix printer. (Serial interface optional).



Processor Hardware SPC-1-//C Interface.

Only three converters, as shown in Column 7, had LED indicators to show they were under power. This not only confirms proper connection of the wall-plug transformer, but reminds the user to unplug it when not in use. While these units draw very little power - about as much as a night light - there is no reason to leave them plugged in when they are not in use. Wall-plug transformers have been known to short out!

Versatility

Columns 8 and 9 have to do with the versatility of the units, and possible other use. Some required changing from 7-bit to 8-bit data to work with some printers. There are other serial devices you might want to connect to a parallel interface, or you might want to use a converter with Apple IIc Port # 2 at 300 baud, leaving Port # 1 available for a serial printer. Only the Tigertronics unit offers complete versatility. Ironically, it was also the only unit tested that required no modification or adjustment of any kind in operating all four printers tested!

Column 10 indicates whether a ribbon cable ("RIBBON") or round cable ("CABLE") is used for the Centronics-type parallel connector. Round cable is generally considered more rugged, but is harder to manipulate in close quarters.

Printers Tested

Columns 11 - 14 show the results of the tests I conducted with four different printers, and Column 15 has some remarks about each converter.

The printers were intentionally chosen to cover a spectrum of types. The Star Micronics Gemini-10X (Photo 1) is a popular dot-matrix printer with graphic capabilities. The CP-80 (Photo 2) is a low-cost dot-matrix printer that emulates the popular Epson series printer commands, and uses a parallel socket with no voltage on pin 18. The Star Micronics Power-Type (Photo 3) is a daisy-wheel

Continued on page 197

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Apple IIc
Continued from page 196

letter-quality printer, and the Star Micronics STX-80 (Photo 4) is an inexpensive thermal dot-matrix printer.

I used a short BASIC program to PRINT text for all printer/converter combinations. I paid careful attention to both printer and converter switch settings, where switches were available. As the chart shows, some converters simply ignored some printers entirely, or required specific printer or converter settings.

I only checked the Gemini-10X for dot-addressed graphics, since it is the only printer in this test supported by the graphics screen dump program I used.

Since all the converters tested were able to drive the Gemini-10X in its graphic mode (although some converters required setting switches), it can be assumed they will drive any graphic printer with the appropriate software driver, normally supplied with graphic programs.

The Converters Tested

It's surprising how many different design approaches can be taken to solve one requirement. All of the converters tested, though some looked similar externally, were very different from one another internally.

The following comments, together with the Remarks and Notes in Table 3, summarize what I found in testing these five converters.

Tigertronics

I found this converter (Photo 5) very easy to use. It worked on all printers I tried with no adjustments or switch settings on either the converter or printer. It also allows broad versatility for other uses, since baud rate and word format are internally selectable with jumpers. If you want hassle-free operation with various printers, this is the unit I recommend.

Technologic Systems

This unit (Photo 6) came in a close second. The external 7-bit/8-bit toggle switch needed setting sometimes, but it operated all the printers tested, and allowed me to select regular or italic printing on the CP-80 just by toggling the bit-switch! Baud rate is selectable inside, but parity and stop bits are not.

Belkin's "Hamlet"

This converter was the easiest to use, since the external power was not usually required, and there were no settings of any kind. However, I couldn't get it to operate the CP-80 at all. This might be the unit for you if you have a specific, dedicated use. Try it first with the printer you intend to use.

Processor Hardware

I liked this unit, shown in Photo 7. I liked the appearance. I liked the extra LED to show printer ready. I wish it worked with more than two of the four printers tested. By the time you read this, that will probably be corrected. There are no internal or external adjustments of any kind.

CNR

The external switches for baud rate and Power/7-bit/8-bit are handy, but some re-engineering is needed, and will probably be done by the time you read this, to operate more printers. This was the only unit tested that offered a female extension connector that acts like a printer switch, allowing the Apple IIc port to be connected to two printers - one serial, one parallel. Clever.

Other Converters

By the time you read this, several other companies will have Apple IIc serial-to-parallel converters available. Based on my experience with the five units tested, you should be sure that you can return the converter for a refund if it doesn't work with your particular printer. Competition may cause prices to drop a little, but not much, since there is a considerable amount of hardware and engineering involved in these converters. ●

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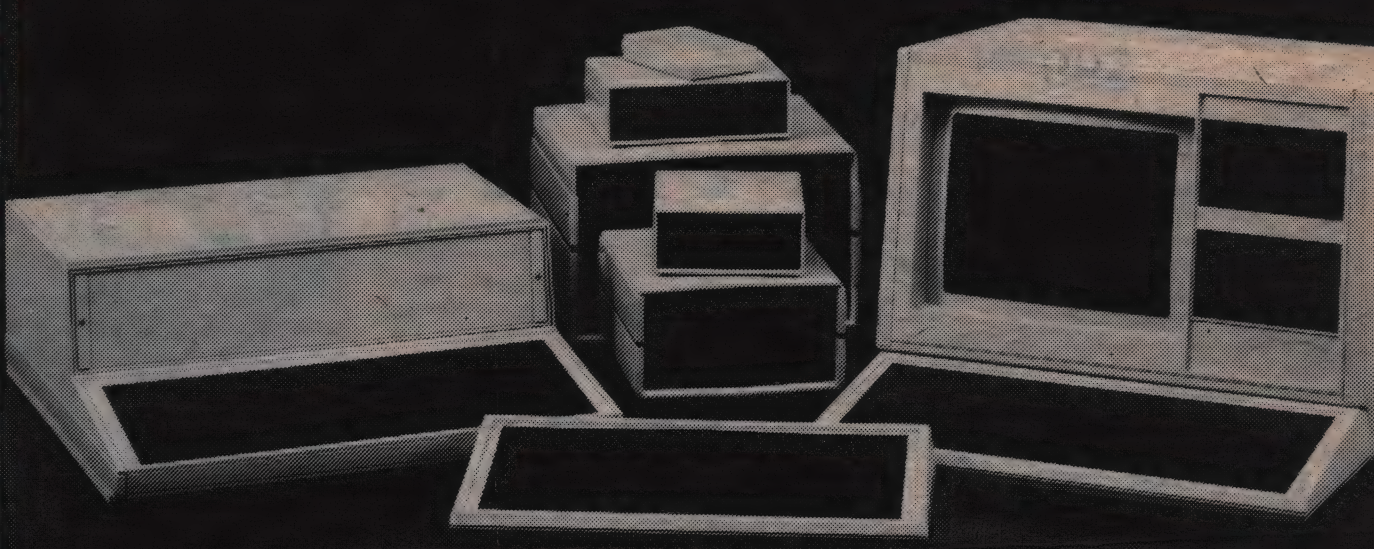

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Electric Dragon

Continued from page 94

When consulting the Oracle, you type in the question you seek help with. You are then asked to press any key to cast the hexagram. Three strokes are necessary for each of the six lines, and you are encouraged to await the "proper moment" for each cast. Generally, a second hexagram will be generated, which the I Ching calls the result of a moving line. Mathematically, there are over 4,000 possible combinations of hexagrams. I kept records on 211 readings, and never once repeated the same combination.

After you have browsed through the interpretation, perhaps studying it a number of times, you have the option of saving it. If you select this, you may add any comments you wish. This is where the time and date are important, for if you later want to review the reading, they may be selected by date as well as by searching for a key word.

Steven Walton, the programmer, neglected to delete some of his readings, for you will find such interesting items as, "On June 22, 1984, at 10:36 a.m." the question Walton asked was, "First reading, the production disk." The hexagram was number 2, The Receptive, and Walton's comment was, "Most appropriate." The next entry was August 13; the hexagram was number 43, Break-Through, the question, "Another day dawns. I must pronounce you demo-grade," and the comment, "Success, deliverance. A bad beginning, a good end" lets you share some of the programmer's elation. But August 15 was not so favorable. "It keeps going from bad to worse." His next reading that day, moments later, shows that the project is nearing delivery: "Friends come. Abundance."

To see how this program can become meaningful, try consulting the oracle at the same hour every day, then record your comments. You can review them later and have a daily diary of your readings and comments. (If any of them are embarrassing, you have the option of deleting them.)

Packaging of the program is excellent. The eight-page manual is spiral-bound in hard covers, and the disk is sealed in a vinyl pouch, eliminating the possibility of getting a disk that has been clobbered by store personnel making their own pirated versions. If eight pages seem skimpy, be consoled by the fact that it is adequate to explain the background of the I Ching as well as how to run the program.

This cannot be considered a game, but its inclusion in your library can provide many pleasant hours of introspection. In today's busy world, that is a precious commodity.

Support by Baen is excellent. Although I had no problems with The Electric Dragon, I had occasion to phone them concerning another program. The question necessitated talking with the programmer, and I was told they'd call me back. I was happily surprised to have them find the answer and return my calll less than two hours later.

The Electric Dragon
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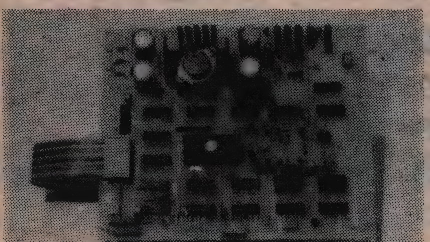

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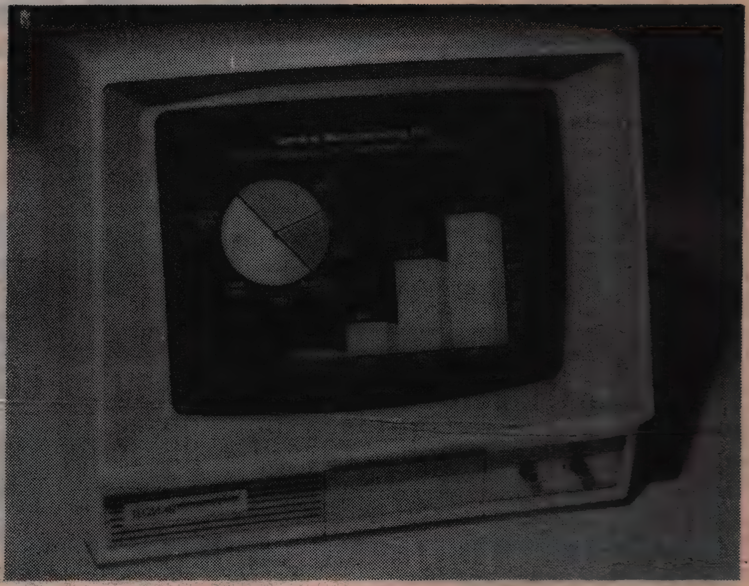

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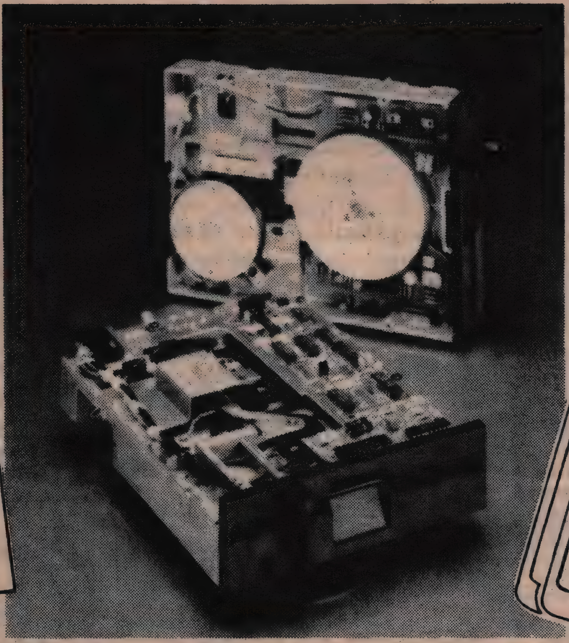

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New Macintosh Releases From Microsoft

Microsoft Corporation announced a new release of Microsoft BASIC for the Apple Macintosh computer that includes a runtime interpreter. This new release will be used by ISVs (Independent Software Vendors) to broaden the distribution of programs written in Microsoft BASIC. Microsoft is offering licensing agreements that permit software vendors to copy and distribute the runtime routine along with their BASIC applications. Now end users who do not have the BASIC Interpreter will be able to run programs written in Microsoft BASIC.

The runtime version of Microsoft BASIC is fully compatible with the Microsoft BASIC Interpreter Version 2.0 for the Macintosh. It can run programs written in Microsoft BASIC that have been saved in the protected or compressed mode. An editor is not included with this new release of Microsoft BASIC, so it cannot be used to write new BASIC programs.

"ISVs who write programs in Microsoft BASIC will benefit the most from the runtime version of BASIC," said Rob Dickerson, Language Product Marketing Manager for Microsoft. "Software vendors have been attracted to Microsoft BASIC because of its easy access to Macintosh features and improved programmer productivity," he said. Before the runtime interpreter was available, programs written in Microsoft BASIC could only be sold to people who already owned Microsoft BASIC. This new release of BASIC will allow software vendors to take advantage of Microsoft BASIC's capabilities, and to broaden the distribution of their products.

For more information contact Microsoft Corporation, 10700 Northup Way, Box 97200, Bellevue, WA, 98009, (206)828-7400.

Also, Microsoft Corporation announced the Microsoft MacLibrary software series, a new software publishing effort by the leading independent producer of Apple Macintosh software. Microsoft MacLibrary releases will complement Microsoft's existing software line with a series of products priced from $49.95 to $149.95. The software series will include many categories new to Microsoft including education, recreation, and home products.

"Microsoft strongly believes in the graphics-based software environment of the Macintosh," said Alan Boyd, Manager of Product Acquisition at Microsoft and Publisher of the MacLibrary product line. "MacLibrary offers an important way to round out our existing product line and bring innovative high-quality Macintosh software to the marketplace more quickly."

With venture capital increasingly rare, many ISVs have found it difficult or expensive to market their products. Through Microsoft MacLibrary, software authors can take advantage of Microsoft's extensive marketing, manufacturing, and distribution resources. The authors are responsible for software development and product support such as program documentation.

Learning Microsoft Multiplan and Microsoft Chart is the first release from the MacLibrary software series. It provides two separate tutorials for learning Multiplan and Chart on the Apple Macintosh computer. The program begins by defining the concepts behind spreadsheets and presentation business graphics, offering numerous examples and sample applications.

This Computer-Aided Instruction (CAI) package greatly reduces the time required to learn the two programs. It lets the user select topics and experiment with applications to provide an overall knowledge of the programs. The program automatically tracks which sections the user has completed.

This interactive learning program was designed not only for first-time users of Multiplan and Chart, but also owners currently using Multiplan and Chart who want to become more proficient with these programs. Learning Microsoft Multiplan and Microsoft Chart also provides an effective way to preview the two programs before purchasing them.

Multiplan and Microsoft Chart is compatible with both the 128K and 512K Apple Macintosh computers. The suggested retail price is $59.95.

Entrepreneur is another new release from the MacLibrary software series. Authored by Harvard Associates, Inc., Entrepreneur simulates the management of a software company.

Entrepreneur tracks inventory, production, profit, and other business statistics for up to a 36-month period. The simulation can be conducted at two levels of difficulty with as many as nine different competitors, human controlled or computer controlled. The user can save the games in progress for multiple players and multiple machines.

The new program is aimed at people with experience in business as well as management hopefuls who aspire to run their own companies. It is particularly useful for those interested in software development and marketing.

Entrepreneur was designed to teach business basics such as managing business operations, interpreting financial reports, and predicting how current events affect the economy and business. By simulating an actual software business, it teaches users how to succeed in a highly competitive marketplace. Users learn how their decisions affect return on investment, and which factors most influence the bottom line.

Entrepreneur is compatible with both the 128K and 512k Apple Macintosh computers. It will be available beginning April 4 through Microsoft retail outlets. The suggested retail price is $49.95.

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Continued from page 86

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Sunol Systems' Sun*Mac: Adds Versatility to the Macintosh

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Sun*Mac connects directly to Sunol's Sun*Disk giving the Macintosh usable storage capacities of 8, 16, 25, 40, 65, and 92 megabytes per hard disk. The Sun*Disk will accommodate up to seven different operating systems at one time, allowing the Macintosh the versatility of networking.

Sun*Mac is extremely fast with data transfer rates of 230,000 bits/second and handles queuing of drive requests from up to 8 AppleTalk users simultaneously.

Sun*Mac is easy to install with the complete Sun*Mac documentation. All utilities are written using standard Macintosh pull down menus and dialog windows.

For more information contact Sunol Systems at 1187 Quarry Lane, Pleasanton, CA, 94566, (415)-484-3322.

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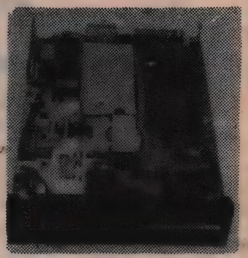

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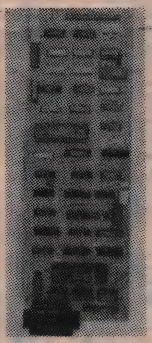

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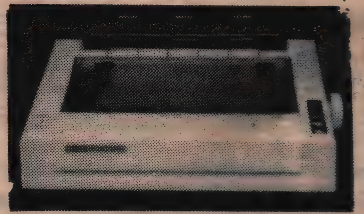

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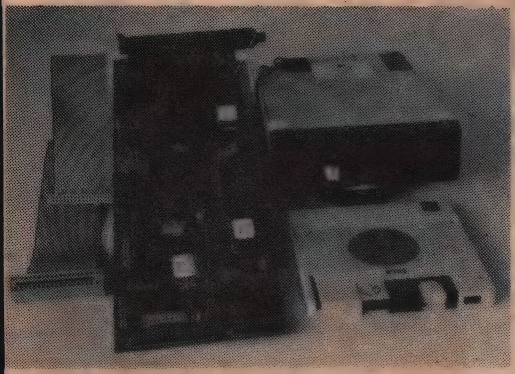

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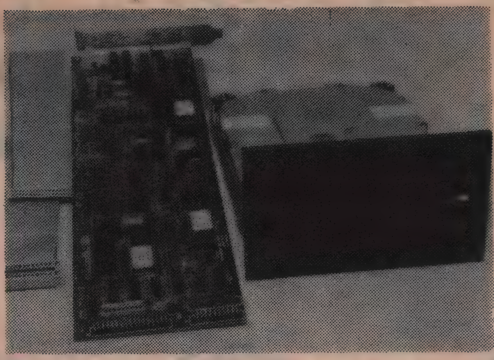

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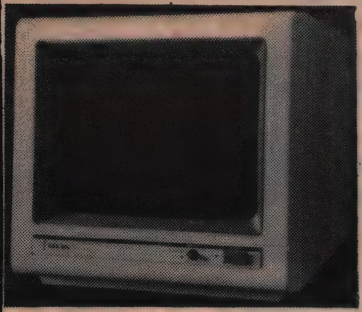

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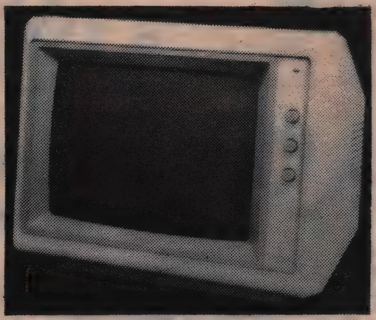

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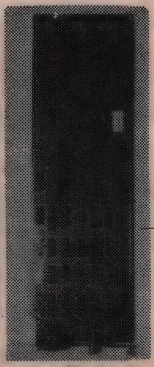

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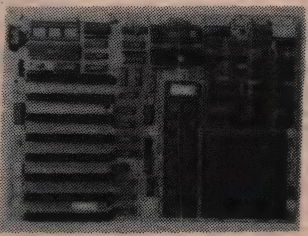

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* Swivel monitor stand	$12

**Prices quoted above do not include UPS shipment charges.
Prices subject to change without notice.
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April 20, 1985
Saturday 10 a.m. to 6 p.m.

April 21, 1985
Sunday 10 a.m. to 4 p.m.

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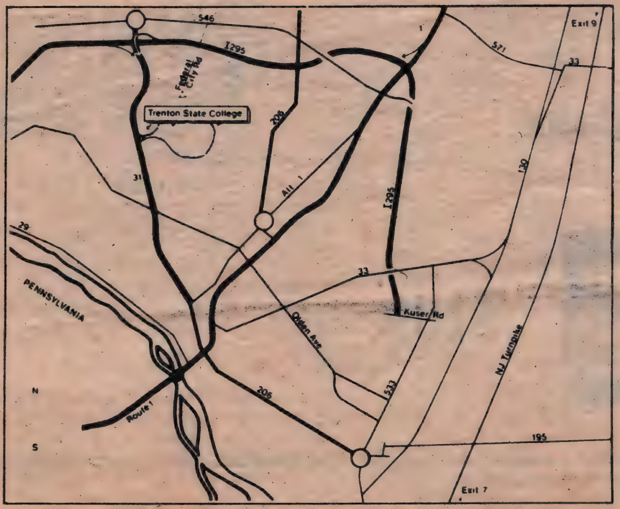

Admission/Registration

General admission, covering both days and all events except banquet $7
Students/senior citizens $3
Sunday only—$5.00 general admission
Children under 12 accompanied by an adult will be admitted free on Sunday.

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TCF'85

I*U*CO is the best thing to happen to personal computing since the personal computer.

I*U*CO is an idea whose time has come.

I*U*CO is the International Union of Computer Owners, an organization designed to protect the interests of computer owners and users against those who would take their money...and then deliver less than they promised.

Here's an overview of some of the vital services I*U*CO provides:

1. Access to the lowest priced, reputable vendor for nearly every computer related need; and,
2. Protection from the rip-off artists, vaporware specialists, false advertisers and other creepy, crawly creatures who have been attracted to the computer industry by the scent of your money; and,
3. Constantly updated information on software and hardware releases, bug reports, fixes and other data individually tailored to your needs through I*U*CO's exclusive Computer Registry; and,
4. Finally, a chance to get even with those characters out there who promise a lot, take your money and then deliver less than they promised.

I*U*CO: a lynch mob with a purpose.

Every computer owner has been ripped off at least once.

Or maybe a dozen times might be a more appropriate number.

In any event, we've all been victimized by the computer industry.

And it wasn't accidental: today's computer industry is filled with hypesters, rip-off artists, vaporware specialists and others whose sole function in life is to part you from your money...while delivering less than you bargained for.

The rip-off might have been a computer that wasn't quite as "compatible' as claimed. Or a computer that didn't quite get delivered at the same time as the "hundreds" of new programs that would support it.

Or it might have been a software package that didn't quite live up to its advertising hype. Possibly, you've been had by a software manufacturer who continuously upgrades their software...charging you a pretty penny for an updated version that simply gets rid of the bugs that shouldn't have been there in the first place.

In a few cases, it might even have been a vendor who took your money...and never quite got around to delivering what you paid for.

In any event, owning a computer has been an open invitation to getting ripped-off in one way or another.

Until now.

I*U*CO means protection.

I*U*CO subscribes to some very ancient wisdom: in numbers, there is strength.

Labor unions learned it a long time ago.

An individual worker had no bargaining power. All the workers in a factory, however, have a lot of muscle.

Automobile owners learned it early on. The American Automobile Association was originally organized to bring motorists together in order to lobby for new roads and highways.

Even the computer industry has learned it: computer manufacturers, software publishers and others in the industry have now banded together in order to get legislative approval for their meaningless "disclaimers" and to restrict your right to copy the software you've purchased.

I*U*CO is designed to be what every collective organization is: a means to protect the special interests of its members.

And, in this case, the members are the victims...the people who own and use personal computers.

The people who, until now, have been powerless.

First of all, I*U*CO means low prices.

The first benefit an I*U*CO member gets is the opportunity to save money.

Lots of it.

I*U*CO maintains a database of every mail-order advertisement that appears in the major computer magazines. When you want the lowest price on something, just (electronically) mail your shopping list to I*U*CO.

Within a day, you'll get the three lowest and most recently quoted prices...and, quite possibly, some still lower prices that haven't been published at all.

I*U*CO protects you.

Of course, buying mail order can get you more than low prices.

It can also get you a lot of problems in delivery.

So, along with the low price quotation, you also get I*U*CO member evaluations and reports about the vendor...and, to make sure that you'll be happy with the product, a bibliography of reviews, articles and letters to the editor about the product or service you want to buy!

In short, as an I*U*CO member, you not only find the lowest price...but you might also find out that you don't really want to spend the money in the first place!

These are the first steps in I*U*CO's program:

1. Getting you the lowest possible prices.
2. Giving you an assessment of the potential vendor.
3. Providing information on the actual use value of the product. *(An awful lot of products sound better in their advertising than they are in reality. That's why so few companies offer a money-back guaranty.)*

Continuing protection from I*U*CO: the Computer Registry.

As an I*U*CO member, you can become part of our exclusive Computer Registry.

You simply register the appropriate information about all the hardware, software and peripherals you own with I*U*CO.

Then, as updates are announced, problems are discovered, fixes released and so on, you automatically get this information.

No more finding out a year after the fact that the current version of your program is 3.14...not the Version 1.7 program you've been using. Likewise, you might find out that the mysterious system error messages you've been getting aren't just your problem, but rather wide spread.

(As a personal note, this I*U*CO service is invaluable. In the early days of personal computers, hardware, software and peripheral manufacturers used to be pretty good about sharing information.

Today, they're not.

In the last few weeks, I personally have learned: a) my MacIntosh 512K Upgrade is defective and won't work with MacPaint under certain circumstances; b) the ROMS in my Anadex printer have been upgraded; c) the ROMS in my IOMEGA Bernoulli box have been upgraded; d) MicroPro eliminated the copy protection on my version of Wordstar 2000 Plus; e) MicroPro had a bug in InfoStar for more than 18 months...and didn't tell anyone.

I*U*CO membership would have avoided these unpleasant surprises.)

With I*U*CO, you get the information you need on an individualized basis...and you get it fast.

You don't have to tear your hair out wondering about a problem. You might even find out about the problem before you encounter it!

I*U*CO: the iron fist.

The best part of I*U*CO has been saved for last.

Yes, I*U*CO will get you lower prices and will give you solid information about the integrity and usefulness of products and vendors.

But, more importantly, your membership in I*U*CO gives you the power of belonging to a community...a community of computer owners and users who need to protect their rights.

For instance, a group of software publishers recently managed to get the Louisiana legislature to pass a law "legalizing" the non-warranties they provide with their software. (You know, "this software is sold without any representations that it will work".)

I*U*CO will fight that kind of nonsense by lobbying against it.

Likewise, when a company...even a major company...announces vaporware, I*U*CO will use the same tools to fight back...to prevent publishers and dealers from getting us all aglow about a new machine or a new piece of software that won't be delivered for months. (For instance, how many people would have bought the MacIntosh a year ago had they known that the "hundreds" of programs to be "shortly available" simply didn't exist?)

Finally, when the situation demands it, I*U*CO will be ready to sue. For example, what do you do in a situation where you run out and buy Wordstar 2000 Plus...only to find out later that its files are not compatible with the original Wordstar? (If you read the advertising, it doesn't say a word about it. You find out after you've laid your dollars on the table!)

There's a lot more to the I*U*CO story.

The whole story of I*U*CO and its benefits takes eight pages to tell. Ads...especially those that tell the truth...are expensive, so we can't take eight pages in this magazine to tell the whole story.

But, if you send us a buck, we'll send you the entire I*U*CO information and enrollment package.

You can make up your own mind whether it's a dollar well spent or not.

International Union Of Computer Owners, Inc.
Suite 4806
30 East Huron Street
Chicago, Illinois 60611

YES, I'm tired of being ripped off. Enclosed is $1.00. Please send me the information and enrollment package for I*U*CO, the International Union of Computer Owners.

I understand that I am under no obligation to enroll.

**** PLEASE PRINT ALL INFORMATION ****

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COMPANY ____________________

ADDRESS ____________________

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TAMPA BAY TRS-80 USERS GROUP, PO BOX 76001. ST. PETERSBURG. FL 33734
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Episcopal Church at 7 pm in Titusville. FL
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PITTSBURGH ATARI COMPUTER ENTHUSIASTS, 111 MONAHAM STREET. ALIQUIPPA. PA 10551

SANYO OF SOUTHWESTERN PENNSYLVANIA USERS' GROUP, 29 WEST MALDEN DRIVE. COAL CENTER. PA 15423

S.P.A.C.E., ATARI USER GROUP, RD 3 WHITE DOGWOOD DR.. GITTERS. PA 17319

SPACE. C/O DENSLOW. 14 PHEASENT CT.. MECH. PA 17055

T.I. 99/4A, PITTSBURGH USER'S GROUP. BOX 18124. PITTSBURGH. PA 15236

SUSQUEHANNA VALLEY USERS GROUP, ATARI. COMMODORE. & TI 99/4A. C/O RAY KROHN. PRESIDENT. P.D. 5 BOX 145. DANVILLE. PA 17821

THE YORK AREA 99'ERS USERS GROUP, C/O ED GEISLER. 4385 BRAIRWOOD COURT. YORK. PA 17404

TI 99/4A USERS PHILADELPHIA CLUB, 8540 TOLBUT ST..

Users Groups

PHILADELPHIA. PA 19152
TI-99/4A PITTSBURGH USERS GROUP, BOX 18124. PITTSBURGH. PA 15236
TRS-80 USERS GROUP OF DELAWARE, 1109 MADISON AVE.. PROSPECT PART. PA 19075
TUG-DC, C/O GARY DITLLIO. 1109 MADISON AVE.. PROSPECT PARK. PA 19076
VALLEY ATARI COMPUTER CLUB, RD 2 COLEMAN DR.. BEAVER. PA 15009
VALLEY FORGE TRS-80 USERS GROUP, 1000 VALLEY FORGE CIRCLE. KING OF PRUSSIA. PA 19406
WYOMING VALLEY COMPUTER CLUB, 302 WYOMING AVE.. KINGSTON. PA 18704

RHODE ISLAND

THE COMPUTER CLUB, 49 DESANO DR.. NARRAGANSETT. RI 02882
NEW ENGLAND 99'ERS, 76 HERSCHEL STREET. PROVIDENCE. RI 02909
RHODE ISLAND COMPUTER HOBBYISTS, PO BOX 599. BRISTOL. RI 02809
TRI STATE USERS GROUP, PO BOX 457. LINCOLN. RI 02864

SOUTH CAROLINA

CHARLESTON COMPUTER SOCIETY, PO BOX 5264. N. CHARLESTON. SC 29406
COMMODORE UPSTATE USERS, P.O. BOX 785. EASLEY. SC 29641 (803) 859-5435
COMMODORE USERS SOCIETY OF GREENVILLE, C/O HORIZON RECORDS-HOME COMPUTERS. 347 S. PLEASOUTBURG DR.. GRENVILLE. SC 29607
GREENVILLE APPLE USER GROUP, PO BOX 5131. GREENVILLE. SC 29106
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NONAME APPLE CLUB, C/O JAMES SUMNER. 80 DUNNEMANN AVE.. CHARLESTON. SC 29403
PIEDMONT 99'ers USERS GROUP, PO BOX 5921. GREENVILLE. S.C. 29606
THE COMPUTERNIKS, C/O USC CC BOOK STORE. PO BOX 1954. CONWAY. SC 29526

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SIOUXLAND 99ERS UG, 2310 S. COVELL. SIOUX FALLS. SD 57105

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ATHENS 99/4A COMPUTER USERS GROUP, PO BOX 309. ATHENS. TN 37303
CHATTANOOGA USERS GROUP (CHUG), PO BOX 136. HIXSON. N 37343. C/O EARL CONWAY
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ET 64 USERS GROUP, PO BOX 495. KNOXVILLE. TN 37901
HOLSTON VALLEY USERS GROUP, 310 WILLOW ST.. MT. CARMEL. TN 37642
K-TOWN 99/4A USERS GROUP, 3506 GARDEN DRIVE. KNOXVILLE. TN 37918. (615)687-8869
MEMPHIS AREA IBM-PC USERS GROUP, PO BOX 241756. MEMPHIS. TN 38124. C/O PETER VERMILYE
MEMPHIS COMMODORE USERS CLUB, P.O. BOX 38095. BARTLETT. TN 38134-0095
MID-SOUTH 99 USERS GROUP, P.O. BOX 38522. GERMANTOWN. TN 38138
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NASHVILLE COMMODORE USERS GROUP, PO BOX 121282. NASHVILLE. TN 37212. C/O DAVE RUSHING OR DALLAS DENNY
TUG (TIMEX USERS GROUP), 1501 - B COMPTON AVE.. NASHVILLE. TN 37212

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AACE ATR-8000 SPECIAL INTEREST GROUP, 9401 MOUNTAIN QUAIL ROAD. AUSTIN. TX. 78758
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ALAMO KAYPRO USERS'GROUP, P.O. BOX 47728. SAN ANTONIO. TX 78265 512-496-6300
ALAMO PC ORGANIZATION, PO BOX 16433. SAN ANTONIO. TX 78216
AMATEUR RADIO CLUB, PO BOX 4391. WICHITA FALLS. TX 76308
APPLE PI, C/O CALY FRANCELL. 2105 ANDREWS HWY.. ODESSA. TX 79761
AUSTIN ATARI COMPUTER ENTHUSIASTS, 8207 BRIARWOOD LANE. AUSTIN. TX 78758
AUSTIN TRS-80 USERS GROUP, PO BOX 43422. AUSTIN. TX 78745
BASIC SOCIETY—IBM USERS GROUP, BOX 815099. DALLAS. TX 75281
BIG COUNTRY HOME COMPUTER USER GROUP, PO BOX 2114. ABILENE. TEXAS 79604
CENTRAL TX COMPUTER, 14 LAVACA. AUSTIN. TX 78701
CENTRAL TEXAS COMPUTER ASSOCIATION, PO BOX 4391. WICHITA FALLS. TX 76308
CENTRAL TEXAS 99/4A USERS GROUP, PO BOX 3026. AUSTIN. TX 78764
CLEARWATER OSBORNE GROUP, C/O MAYNARD HUNTLEY. PO BOX 57613. WEBSTER. TX 77598
CLUB 1802, PO BOX 985. DICKINSON. TX 77539
COMMODORE (HOUSTON) USERS GROUP, C/O JOHN WALKER. EDITOR OF NEWSLETTER. 8738 WILDFOREST. HOUSTON. TX 77088
COMP HOBBYIST GROUP, UTA. ARLINGTON. TX 76109
COMPUGUILD TRS-80 GROUP, 2211 S. LIPSCOMB. AMARILLO. TX 79109
CORPUS CHRISTI COMPUTER CLUB, 801 ORLEANS. CORPUS CHRISTI. TX 78418
CORPUS CHRISTI TRS-80 USERS GROUP, 6214 HIDDEN COVE. CIRPUS CHRISTI. TX 78412
D/FW IBM USERS, 1913 DALWORTH ST.. GRAND PRAIRIE. TX 75050
DAL-ACE, 916 E. BERKELEY. RICHARDSON. TX 75081
DALLAS-AGGIE COMMODORE 64 CLUB, 2914 POPLAR TRAIL. GARLAND. TX 75042. (214) 494-0839
DALLAS APPLE CORPS, PO BOX 5537. RICHARDSON. TX 75080
DALLAS COUNTY COMMODORE CLUB, 1913 DALWORTH STREET. GRAND PRAIRIE. TX 75050
DALTRUG, TRS-80 USERS GROUP, INC., PO BOX 400472. DALLAS. TX 75240
DYNASTY SMART-ALEC USER'S GROUP, (S.M.U.G.). C/O RICHARD ZERWICK. 15033 KIMBERLY LANE. HOUSTON. TX 77079. SOURCE ID #TCW003
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EL PASO COMP GRP, ELECTRONICS BLDG. EL PASO. TX 79901
FORT WORTH APPLE USERS GROUP, BOX 13903. ARLINGTON. TX 76013 C/O GARTH CLOSE
GROUP BUY USERS, PO BOX 830119. RICHARDSON. TX 75083
GROUP 80, DAVIS HALL. ARLINGTON. TX 76109
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HUGTIBBS TI99/4A 2401 CLEAREMONT. ST. JOHN'S SCHOOL. HOUSTON. TX
INTERNATIONAL COLOR COMPUTER CLUB, 2101EAST MAIN STREET. HENDERSON. TX 75652
KAYPRO CLUB OF AUSTIN, PO BOX 9791. AUSTIN. TX 78766
LUBBOCK IBM PC SIG, PO BOX 98117. LUBBOCK. TX 79499
MCTRUG, C/O ROBBIE G. YODER. 5413 Rita Kay Lane. Ft. Worth. TX 76119
METROPLEX CP/M INTEREST GROUP, P.O. BOX 863909. PLANO. TX 75086
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SUN CITY 99/4A COMPUTER CLUB, PO BOX 6966. EL PASO. TX 79906
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THE NATIONAL ASSOCIATION OF TRS II USERS, PO BOX 14091. AUSTIN. TX 78761
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WICAT USER'S GROUP, PO BOX 7594. THE WOODLANDS. TX 77380
WICHITA VALLEY TRS-80 USERS GROUP, (INCLUDES MODEL I. MODEL 3 AND COLOR COMPUTER). PO BOX 4391. WICHITA FALLS. TX 76308. J. WESLEY B. TAYLOR. PRES.

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ATARI COMPUTER ENTHUSIASTS OF UTAH, 5522 SARAH JANE DR.. KEARNS. UT 84118
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CAPITOL AREA COMMODORE USERS, 2054 EAKINS COUT. RESTON. VA 22091
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RICHMOND TRS-80 USERS GROUP, 4115 HOPKINS RD.. RICHMOND. VA 23234
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TIDEWATER COCOSIG, C/O BRUCE NICHOLS. 107 PASTURE ROAD. POQUOSON. VA 23662
TIDEWATER COMMODORE USERS GROUP, 4917 WESTGROVE RD.. VIRGINIA BEACH. VA 23455. C/O FRED MONSON
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TIDEWATER TRS-80 USER GROUP, PO BOX 10281. NORFOLD. VA 23513
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WASHINGTON AREA C-64 USERS GROUP, 7426 ELDORADO ST.. MCLEAN. VA 22201
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INTERNATIONAL SOFTWARE SOCIETY, 2665 1250TH EAST.WHIPBEY ISLAND. WA 98277
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The NATIONAL USERS GROUP, MICHAEL RUSSELL. P.O. BOX 2084CS. PULLMAN. WA 99163
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NORTHWEST COMPUTER SOC., POB 4193. SEATTLE. WA 98104
OLYMPIA COMPUTER SOCIETY, 8540 MILL BIGHT RD. NE.. OLYMPIA. WA 98506. ATTN: CHARLEY S. HEATH
OLYMPIA KAYPRO U.G., 6925 4th Way S.E.. Olympia. WA 98503
PACIFIC NORTHWEST HEATH USERS GROUP (P.N.H.U.G.), C/O NATHAN A. HALL. PO BOX 993. BELLEVUE. WA 98009
PUGET SOUND TRS-80 USERS GROUP, C/O BURIEN LIBRARY. 14700 6TH AVENUE S.W.. SEATTLE. WA 98166
PUGET SOUND 99ER'S, TEXAS INSTRUMENTS USERS GROUP. PO BOX 6073. LYNNWOOD. WA 98036
"R" ATARI GROUP, 1691 BEECH LANE. OAK HARBOR. WA 98277
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THE CONSTANT SOCIETY, PO BOX 45513. SEATTLE. WA 98105
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Z-80 UNDERGROUND, 152 HARYU ROAD. LONGVIEW. WA 98632

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ECUG, P.O. BOX 2381. ELKINS. WV 26241
MICRO SYSTEMS U.G., 14 EAST LINCOLN STREET. BUCKHANNON. WV 26201
MOUNTAIN STATE COLOR COMPUTER USERS GROUP, PO BOX 1084. MORGANTOWN. WV 26507
PERSONAL COMPUTER CLUB, 2107 CAPITOL DRIVE. PARKERSBURG. WV 26101

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DURANT COMPUTER CLUB, 901 S. 12TH STREET. WATERTOWN. WI 53094
EAU CLAIRE ATARI VALLEY CHIPPEWA ATARI USERS GROUP, C/O MORT SIPRESS. 1735 COOLIDGE COURT. EAU CLAIR. WI 54701
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G&L ELECTRONICS TI USERS GROUP, C/O GENE OLIG. ROUTE 3 FOND DU LAC. WI 54935
GREEN BAY 99ERS, C/O JOHN VANDERMUS. 124 S. IRWIN AVE.. GREEN BAY. WI 54301
MADAREA 99ERS, C/O MARCIA SCHMIDT. 2118 HIGH RIDGE TRAIL. NO. 302. MADISON. WI 53713
MADISON COMPUTER SOCIETY, C/O J.SCRENK. 3102 ASHFORD LN.. MADISON. WI 53713
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MILWAUKEE AREA 99ER, C/O JIM VINCENT. 2007 NORTH 71ST STREET. WAUWATOSA. WI 53213
MILWAUKEE AREA COMPUTER, TECH. INST., PEWAUKEE. WI 53072
MILWAUKEE AREA USERS GROUP, 2007 N. 71st ST.. MILWAUKEE. WI 53213
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SINCLAIR MILWAUKEE USERS GROUP, P.O. BOX 101. BULTER. WI 53087
THE EAU CLAIRE ATARI USERS GROUP, 1406½ MAPPA ST.. EAU CLAIRE. WI 54701
TI 99/4ALL USERS GROUP, C/O BOB ANDERSON. 1008 MAIN ST.. EAU CLAIRE. WI 54703
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TRS-80 UG MADISON, 201 W. MIFFLIN. MADISON. WI 53703

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OMEGA, C/O GEOFF COHEN. 72 SPOFFORTH ST.. HOLT. ACT 2615
T.I.S.H.U.G., PO BOX 595. MARRICKVILLE. N.S.W. 2204
TASMANIAN USERS GROUP, C/O DAVID TASVER. 111 BASS HWY.. WESTBURY TAS 7303
TI USERS GROUP IN MELBOURNE, 59 LANDSTROM QADRANT. KILSYTH. VICTORIA 3137

ENGLAND

CHURCH COMPUTER USERS' GROUP, C/O REVEREND R.S. WILSON. GREENSIDE VICARAGE. RYTON. TYNE AND WEAR. ENGLAND

CANADA

CHANNEL 99'ER USERS GROUP, C/O WENTWORTH SUPPLIES. P.O. BOX 1005. STATION A. HAMILTON. ONTARIO. CANADA L8N3R1
LOGIC, P.O. BOX 696. POSTAL STATION B. WILLOWDALE. ONTARIO. CANADA M2K 2P9. 416-881-8120
MICRO ORDINATEUR MILLE—ILES, 673 CLAIRETTE. FABREVILLE. LAVAL QUEBEC H7P 2Y3
MONTREAL TRS-80 USERS GROUP, 1176 PHILLIPS PLACE. SUITE 021. MONTREAL. QUEBEC. CANADA H3B 3C8
NINE T NINE USERS GROUP, 55 CORDELLA AVE.. TORONTO. ONTARIO. CANADA M6N2J7
TILT, C/O G.H. Forder. 93 SCOTT ST.. TRENTON. ONTARIO. CANADA K8V3B5 (613) 392-7935
T.I.N.S. C/O 321 IONY HILL. LR. SACKVILLE. NS. B4E 1M6
QUEBEC ASSOCIATION DES UTILISATEURS d'ORDINATEURS DU QUEBEC, C.P. 685 SUCC. "H". MONTREAL QEBEC H3G 2M6
QUEBEC/CANADA, ASSOCIATION DES UTILISATEURS D'ORDINATEUR DU QUEBEC, B.P. 122 SUCC. F. MONTREAL QUEBEC H3J 2K8

— ONTARIO —

APPLE USERS GROUP OF MUI, C/O BERT WILLIAMS. 47 TUCKETT ST.. SAULT STE. MARIE. ONTARIO P6A 4G8
CANADIAN COMMODORE COMPUTER CLUB (CCCC), C/O STRICTLY COMMODORE. 47 COACHWOOD PLACE NW. CALGARY. ALTA.. ALBERTA T3H1E1
I.E.E.E. STUDENT BRANCH, COMPUTER CHAPER, C/O EE DEPT. UNIVERSITY OF WATERLOO. WATERLOO. ONTARIO N2L 361
"SEE ALSO MICHIGAN" (SAULT STE. MARIE)
TORONTO OHIO SCIENTIFIC, IDEAS EXCHANGE, PO BOX 29. STREETSVILLE. ONTARIO. ALBERTA L5M2B7
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SENECASOFT, C/O DIETER ECKHARDT. RUCKERSTSREET 1. 4100 DUISBURG 14. W. GERMANY

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MICROCOMPUTER CLUB, C/O ALFREDO BOZALI. FTE. DE QUIJOTE #5. MEXICO. IO. D.F.

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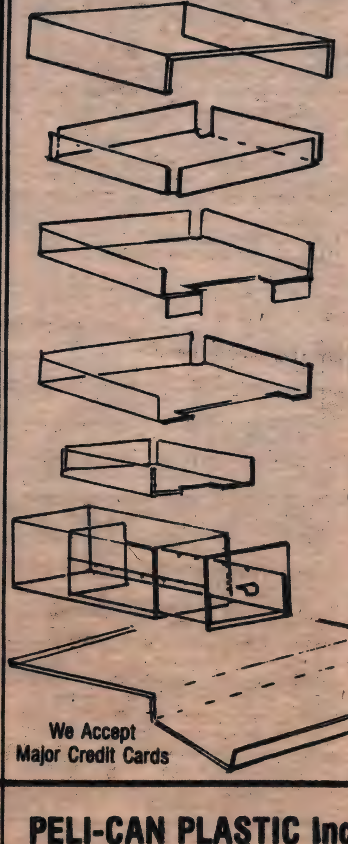
COMMODORE USER'S GROUP OF PUERTO RICO, CALLE 16 35-24 VILLA CAROLINA. CAROLINA. PR 00630 (809)762-2422
THE VIC-20 USER'S GROUP, C/O ROBERTO MORALES. JR.. 655 HERNANDEX ST.. MIRAMAR. PUERTO RICO 00907

TRINIDAD

TRINIDAD ASSOCIATION OF COMMODORE OWNERS (TACO), C/O BRENT MUNDY. 118 MEADOW DR.. ORANGE GROVE. TACARIGUA. TRINIDAD

CALIFORNIA

WEST LOS ANGELES VICTOR USERS GROUP, C/O GUY WONG 715 UNIVERSITY AVENUE. SACRAMENTO. CA 9003



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Bulletin Board

Important Notice On Bulletin Boards

New Procedure For Registering Your Board

Starting now - All BBS Listings are good for three months. After that period they will be purged unless we receive a Post Card or Letter saying the board is active. In addition, any reader who contacts a board can confirm that it is active, but it is up to the SYSOP to keep us current.

We thank you for your cooperation. We will keep the listings on a Data Base so please send in your notices every three months.

Thank You

ABBS Apple Mate. New York. NY 201-864-5345
ABBS CNNJ. Pompton Plains. NJ 201-835-7499
ABBS Livingston. NJ 201-994-9620 *24
AMIS .Park Ridge. NJ 201-391-5519
APHRODITE-E, 201-831-1042
APPLE OASIS, Chester. NJ 201-879-4392. 5pm-12am
ARMUDIC Washington. DC 201-276-8342
ATARI, Edison. NJ 201-549-7591
THE BEACH, Bay Head. NJ 201-892-8172
CFONJ/TBBS, Linden. NJ 201-486-2956. 300/1200 Baud *24
COMBOARD-64, Teaneck. NJ 201-833-2846 7pm-7am
CONFERENCE THREE Flagship. Denville. NJ 201-627-5151 *24
DAVID'S PLACE, Hillsdale. NJ 201-666-7696 *24
DIAL-YOUR-MATCH #14 201-272-3686
DIAL-YOUR-MATCH #21 201-462-0435
FORUM 80 Monmouth Brielle. NJ 201-528-6623
GENERAL STORE, Hillside. NJ 201-666-2646 *24
HUDSON COUNTY COMMODORE BBS, Union City. NJ 201-864-7430 *24
IBM RBBS ESSAYS SOLICITED, 300/1200 BAUD ASCII MODEM 201-858-2742 *24
NEW JERSEY TELECOM, 201-635-0705 *24
PENTACLE, 201-858-2742 *24
PHOTO-80, Haledon. NJ 201-790-6795
PMS- Rutgers Univ. Microlab Piscataway. NJ 201-932-3887
PMS- Shrewsbury. NJ 201-747-6768
THE RADICAL BOARD, 201-837-8504 *24
RATS Systems 201-887-8874
RCP/M MCBBS Flanders. NJ 201-584-9227 *24
RCP/M TPM (RIBBS) Englishtown. NJ 201-446-6359 *24
RCP/M RBBS Ocean. NJ 201-775-8705
RCP/M RBBS Paul Bodganvich. NJ 210-747-7301
RCP/M RBBS Rutgers New Brunswick. NJ 201-932-3879 *24
SKYLANDS BBS Ringwood. NJ 201-962-4956 *24
TBBS Metuchen. NJ 201-494-3649 *24
TIBBS Brick. NJ 201-477-7263
TIBBS Tom's River. NJ 201-929-8161
THE TRON BOARD, North Bergen. NJ 201-869-5460
ARMU Washington. 202-276-8342
DYNABOARD-64, Washington. D.C. 202-686-5230 *24
F.S.L.—COMMODORE Washington. D.C. 202-745-2973 *24**PCP/M** RBBS Cranford. NJ 202-272-1874
PSBBS Washington. D.C. 202-337-4694 *24
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BULLET-80 Seymour. CT 203-888-7952
MET-CHEM-BBS Hamden. CT 203-281-7287 business hours
THE SWITCHBOARD NETWORK Clinton. CT 203-669-3456
TELECOM 7 New Fairfield. CT 203-746-5763 *24
The BULLETIN BOARD Tuscaloosa. AL 205-758-5017 Monday. Wednesday. Friday. Saturday. Sunday 8pm-7am

BULLETIN BOARD

The **Bulletin Board** is a regular feature of *Computer Shopper*. This is where you can list your public access of community bulletin board at no charge. If you would like to have your name, BBS and phone number listed send it to us. BBS listings are in area code sequence.

Send listings to:

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ABBS Apple Crate II. Seattle. WA 206-244-5438
A-C-C-E-S-S Olympia. WA 206-866-9043 *24
AMIS Space Washington. 206-525-3412
ARBB Seattle. WA 206-546-6239
DIAL-YOUR-MATCH #16 206-256-6624
ESKIMO NORTH, Seattle. WA 206-367-3837 *24
FORUM-80 Seattle. WA 206-723-3282
IQ TECHNOLOGY, Washington. D.C. 206-451-0232
JCTS Redmond. WA 206-883-0403 *24
MAIL Board-82 Seattle. WA 206-527-0897 *24
MINI-BIN Seattle. WA 206-762-5141
MSC-80 Everett. WA 206-334-7394
MTG ELECTRIC BBS Marysville. WA 206-653-3801
PCP/M Silicon Valley 206-458-3086
PMS-SOFTWARE Unlimited Kenmore. WA 206-486-2368 *24
SEACOMM-80 Seattle. WA 206-763-8879 *24
THE CONSTANT SOCIETY Seattle. WA 206-525-5947
WHIDBEY ISLAND COMPUTER SOCIETY, Oak Harbor. WA 98277 206-675-9786
ADVENTURE IN THE TRIVIAL DIMENSION Windham. ME 207-892-9810
CONFUSER USER Windham. ME 207-854-2687
MAGIC CRYSTAL Windham. ME 207-774-5570
TIBBS, Portland. Maine 207-797-5690
IDAHO TELECOM SERVICE Rigby. ID 208-745-9438 *24
IFBBS Idaho Falls. ID 208-523-7400. 300/1200 baud *24
CBBS Sequoia Computer. Visaslia. CA 209-739-1776
DIAL-YOUR-MATCH #26 Clovis. CA 209-298-1328
ABBS Queens. NY 212-896-0519
AMBER ZONE Staten Island. NY 212-967-3789 *24
AMIS, Info New York. 212-767-6633
AMIS, New York. 212-241-8965
AMIS, New York 212-568-0682
BBS –1 Woodhaven. NY 212-441-3755
BBS –2 Woodhaven. NY 212-441-3766
BBS –3 Woodhaven. NY 212-441-5719
BBS –4 Woodhaven. NY 212-441-5907
BRONX BBS. NY 212-933-9459
BULLET-80 New York. NY 212-740-5680 *24
COMM-80 Queens. NY 212-897-3392 *24
CONNECTION-80 Manhattan. NY 212-991-1664
CONNECTION-80 212-441-3755 *24
FIREFOX Computer World. NY 212-454-1462 *24
GRAND CENTRAL TERMINAL 212-682-0681 *24
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PALADIN'S PALACE, FOREM CBB. Queens. NY 212-699-0861 *24
PGA NAT'L LIBRARY New York. NY 212-420-0953
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PIRATE'S LANE, NYC. NY 212-421-7093
TCBBS Astrocom. New York. NY 212-799-4649
TCBBS B.A.M.S. New York. NY 212-362-1040 *24
TCBBS Leigh's Computer World. NY 212-879-7698
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VINEYARD COMPUTER WORLD, NY 212-357-5679 *24
ABBS Computer Conspiracy Santa Monica. CA 213-829-1140
ABBS Pacific Palisades. Los Angeles. CA 213-459-6400
ALL NIGHT BBS 213-564-7636
AMIS TABBS. CA 213-366-2125
AMIS WVAUG. CA 213-783-8373
BBS B.R. Los Angeles. CA 213-394-5950 *24
CHECKER BOARD Torrance. CA 213-538-9795
COMPUTER CONNECTION 213-657-1799
CONFERENCE-TREE #4 Santa Monica. CA 213-394-1505
CONFERENCE-TREE Kelp Bed. Los Angeles. CA 213-372-4800
DATAMATE Canoga Park. CA 213-998-7992

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DIAL-YOUR-MATCH –7 213-840-8252
DIAL-YOUR-MATCH –9 213-345-1047
DIAL-YOUR-MATCH –11 213-242-1882
DIAL-YOUR-MATCH –25 213-842-9452
DIAL-YOUR-MATCH –28 213-764-8000
DIAL-YOUR-MATCH –36 213-452-6111
DRAGONS GAME SYSTEM 213-428-5206
ELECTRIC LINE CONN. Sherman Oaks. CA 213-789-9512
FUNNY PHARM, CA 213-410-0221 *24
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FUNNY PHARM VI, CA 213-316-6033
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NAVATION CO., Los Angeles. CA 213-881-6880
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NET-WORKS Softwarx Los Angeles. Ca 213-473-2754
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RCP/M RBBS Downey. CA 213-861-2313 *24
RCP/M CBBS Pasadena. CA 213-799-1632 *24
RCP/M RBBS BBS Valley 213-360-5053
RCP/M RBBS Palos Verdes. CA 213-541-2503 *24
RCP/M RBBS Softwar Store Los Angeles. CA 213-296-5927 *24
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ABBS Teledunjon I Dallas. TX 214-530-0858
ABBS The Moon. Dallas. TX 214-931-3437. 3436. 3438. 3439
AMIS Allen. TX 214-727-2824 *24
AMIS Dallas. TX 214-680-9018
BBS-80 DALTRUG Dallas. TX 214-235-8784 *24
BULLET-80 Hawkins. TX 214-769-3036
METROPLEX CP/M INTEREST GROUP RBBS/RCPM Plano. TX 214-867-2068 *24
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NET-WORKS Apple Shack. Dallas. TX 214-644-4781 *24
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NET-WORKS Winesap Dallas. TX 214-824-7455
RCP/M CBBS Dallas. TX 214-913-8274
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AMIS Pennsylvania 215-250-9471
AMIS Pennsylvania 215-432-9848
BULLET-80 Langhorne. PA 215-364-2180
COMNET-80 North Wales. PA 215-855-3809
COMPCOM 215-968-0170 300/1200 *24
HEMRES-80 Allentown. PA 215-434-3998
LEHIGH PRESS BB, PA 215-435-3388
RBBS Pennsylvania 215-398-3937
RBBS Pennsylvania 215-836-5116
TBBS Reading. PA 215-929-5348
ABBS Akron Digital Group. Akron. OH 216-745-7855 *24
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ARCADIA BBS Akron. OH 216-644-1014
ATARI Ohio 216-582-2797
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BIG BOARD (CP/M) Akron. OH 216-745-7819
BULLET-80 Chesterland. OH 216-729-2769
CAMELOT ATARI BBS Akron. OH 216-864-7002 *24
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COMMODORE CLIPPER Akron. OH 216-864-7930
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PMS Massillon. OH 216-832-8392 *24
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TBBS of Akron 216-724-2125 *24
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UNDERGROUND 64 Lorain. OH 216-282-8848 8pm-7am days
VICCOMM Akron. OH 216-896-0775 *24
CENTRAL IL. CONNECTION Riverton. IL 217-629-7006 *24
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ARMUDIC Computer Age Baltimore. MD 301-587-2132
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BBS IBM 300/450/1200 BAUD. 301-267-4930 *24
BBS IBM PC Rockville. MD 301-949-8848 *24
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A.M.I.S. Denver. CO 303-758-2927 *24
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FIDO-NET Denver. CO 303-973-9338 *24
FIDO-NET GMCC (-77) Denver. CO 303-497-6968 *24
FIDO-NET –334 Denver. CO 303-497-6968
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I.D.S. STARCROSS Denver. CO 303-781-8212 *24
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MOUSE HOLE—ATARI Lakewood. CO 303-988-5562
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RCP/M CUG-NOTE Denver. CO 303-781-4937 *24
RCP/M RBBS Arvada Elec. Colorado Springs. CO 303-634-1158 *24
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NET-WORKS Charleston. WV 304-345-8280
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BBS Homestead. FL 305-246-1111
BBS The Notebook West Palm Bch.. FL 305-686-4862
C-64 BBS1 305-238-2271. This is a Punter BBS
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EL-SHIFT-OH Cocoa. FL 305-783-8905 *24
EMERALD CAVERN Hollywood. FL 305-981-4252
FORUM-80 Ft. Lauderdale. FL 305-772-4444 *24
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GREEN MACHINE SPACECOAST 2 305-453-6561 *24
CABLE BOX Pembroke Pines 305-432-5969 *24
MAGIC CITY MICRO (MCM) Magic City. FL 305-271-6644 *24
MAGIC CITY MICRO (MCM) SOFTWARE FORUM Coral Gables. FL 305-441-2150 (6pm-9am)
MAGIC CITY WORLD OF TRON Miami. FL 305-264-9964 *24
ONE STEP BEYOND Longwood. FL 305-831-0032
NET-WORKS Big APPLE Miami. FL 305-948-8000
PIRATE-80 305-255-8059 *24
QUILL, AMIS BBS Palm Bay. FL 305-724-2303
RAMIK ONE BBS Lake Worth. FL 305-439-8710
RBBS HEATH KIT 305-823-2281 6pm-8am
RBBS SOUTHERN MICRO 305-625-3181 *24
SCAUG BBS Merritt Island. FL 305-453-6998
SPACE SHUTTLE BBS (SSBBS) Satellite Beach. FL 305-777-4714 *24
TBBS Orlando. FL 305-644-8327 *24
TECH-80 305-266-1032 *24
THE BYTE SHOP 305-261-3639. Networks Not BBS
TIBBS West Palm. FL 305-793-8050
TRADE 80 Ft. Lauderdale. FL 305-525-1192
TRADE 80 of Miami 305-947-7930 *24
TRADE 80 Pompano Bch. 305-426-8080 *24
TREASURE QUEST Vero Beach. FL 305-562-1627 *24
UNICORN, AMIS BBS Palm Bay. FL 305-729-9575
YBBS The Heath Bar 305-940-8795 *24
PET BBS Se Wyoming PUG 307-637-6045 *24
THE EXPRESS East Peoria. IL 309-699-6359 noon-11pm CST
NET-WORKS MAGIE Galesburg. IL 309-342-7178
ABBS Chicago. IL 312-743-3153
ABBS Gamemaster. Chicago. IL 312-475-4884 *24
ABBS Lincolnwood. IL 312-764-6502
ABBS Rogers Park. Chicago. IL 312-973-2227
AMIS Bellwood. IL 312-544-7228
AMIS Chicago. IL 312-789-3610 *24
AMIS Lombard. IL 312-620-6441
The BASIC BBS Aurora. IL 312-896-9628 3pm-11pm
CBBS Chicago. IL 312-545-8086 *24
CBBS Chicago. IL 312-876-0974
CBBS Dolton. IL 312-849-1132
CHICAGO GREEN MACHINE 312-622-4442
CO-OP BBS Arlington Heights. IL 312-228-1495
CP/M Chicago. IL 312-326-4392
CP/M Chicago. IL 312-338-8827
CP/M Chicago. IL 312-537-7888
CP/M Chicago. IL 312-861-1797
CP/M Downers Grove. IL 312-852-1305

CP/M Glen Ellyn 312-469-2597
DIAL-YOUR-MATCH –39 312-243-1046
HCOM Chicago. IL 312-267-2066
HP1 Palantine. IL 312-397-8308
MCMS C.AM.S. Chicago. IL 312-927-1020 *24
MCMS Hanover Park. IL 312-289-7619
MCMS L.A.M.S. Round Lake. IL 312-740-9128
MCMS Waco Hotline. Schaumburg. IL 312-351-4374 *24
MCMS Wheaton. IL 312-462-7560
NESSY Chicago. IL 312-773-3308
NET Arlington Heights. IL 312-392-2403
NET ^{s} Arlington Heights. IL 312-398-0970
NET ^{s} Chicago. IL 312-545-5866
NET Chicago. IL 312-685-9573
NET Chicago. IL 312-278-7261
NET Lombard. IL 312-627-5138
NET Wheaton. IL 312-260-0748
NET Skokie. IL 312-674-9246
NET-WORKS Chipmunk. Hinsdale. IL 312-323-3741 *24
NET-WORKS North Parks. Chicago. IL 312-745-0924
OCCCS #2 Wheaton. IL 312-588-7917
OT Berwyn. IL 312-795-0871
PBBS Co-Operative Comp. Palatine. IL 312-359-9450 *24
PCM Midlothian. IL 312-396-1022
PET BBS COMMODORE Chicago. IL 312-397-0871 *24
PMS Chicago Public Library 312-235-3200
PMS Chicago. IL 312-373-8057 *24
PMS I.A.C. Lake Forest. IL 312-295-3926 *24
RIPCO 1200/300 BAUD. Chicago. IL 312-528-5020 *24
RCP/M AIMS Hinsdale. IL 312-789-0499 *24
RCP/M IBM PC Niles. IL 312-259-8086
RCP/M Logan Square. Chicago. IL 312-252-2136
RCP/M NEI. Chicago. IL 312-949-6189
TBBS Chicago. IL 312-445-4545
TIBB Oak Park. IL 312-848-3669
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WAUKEGAN PUBLIC LIBRARY SYSTEM BBS Waukegan. IL 312-623-2226
ABBS Detroit. MI 313-477-4471
ABBS Michigan Apple-Fone Southfield. MI 313-357-1422
AMIS A.R.C.A.D.E. Sterling Hgts.. MI 313-978-8087 *24
AMIS M.A.C.E. Detroit. MI 313-368-2064 *24
AMIS MACE. Michigan 313-274-3940
AMIS Michigan 313-544-0885
APPLE-GRAM 313-292-0389
BBS Metro Detroit. MI 313-455-4277
BULLET-80 Waterford. MI 313-683-5076 *24
CBM-U Commodore Detroit. MI 313-273-9551 *24
CCCC BBS Canton. MI 313-981-5061
DAVY JONES LOCKER 313-764-1837
DIAL-YOUR-MATCH –37 313-736-1398
MC CBBS 313-243-4561 *24
RCP/M Detroit. MI 313-584-1044
RCP/M MCBBS Keith Peterson. Royal Oak. MI 313-759-6569
RCP/M MCBBS TCBBS Dearborn. MI 313-846-6127 *24
RCP/M RBBS Pontiac. MI 313-338-8505
RCP/M RBBS Southfield. MI 313-559-5326 *24
RCP/M RBBS Westland. Mi 313-729-1905
SYSTEMS PLUS Flint. MI 313-742-6932
TIBBS Detroit. MI 313-288-0530
TIBBS Oak Park. MI 313-544-7788
TIBBS Warren. MI 313-751-1119
TREASURE ISLAND 313-547-7903
TWILIGHT PHONE 313 775-1649 *24
WESTSIDE DOWNLOAD Detroit. MI 313-533-0254
ABBS Century Next Computers. ST. Louis. MO 314-442-6502
ABBS St. Louis. MO 314-838-7784 *24
AMIS ComputerCave MO 314-432-7034
MIDWEST St. Louis. MO 314-227-7120
NET-WORKS Computer Station. St. Louis. MO 314-432-7120
PET BBS Commodore Comm. Lade. St. Louis. MO 314-625-4576
FORUM-80 Wichita. KS 316-682-2113 *24
TIBBS Wichita. KS 316-681-3167
COLOSSUS-TIBBS SYSTEM Wichita. KS 316-687-4307
FORUM-80 Wichita. KS 316-682-2113 *24
GREAT INLAND SEA BBS 316-685-1190 6pm-8am
INFOEX 80 316-722-9526
OMEGA BBS Wichita. KS 316-685-8202 SYSOP Donna Molony *24
TIBBS Wichita. KS 316-681-3167
The COCO BULLET Indianapolis. IN 317-291-7827 *24
PMS Indianapolis. IN 317-787-5486
PMS SOFTWARE EXCHANGE Indianapolis. IN 317-251-7796 8:30pm-10am
CBM-U COMMODORE Crowley. LA 318-783-2647 *24
DIAL-YOUR-MATCH –66 Layfayette. LA 318-233-7472
FORUM-80 Shreveport. LA 318-631-7107 *24
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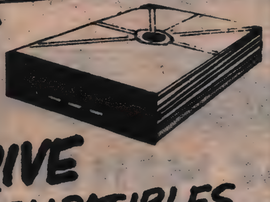

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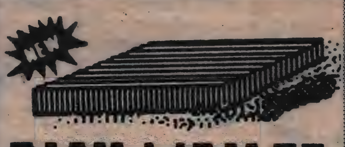

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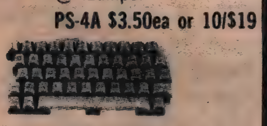

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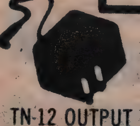

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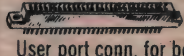

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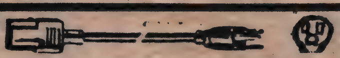

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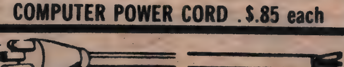

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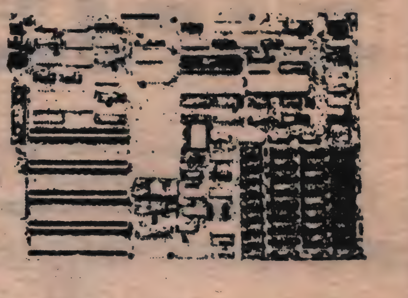

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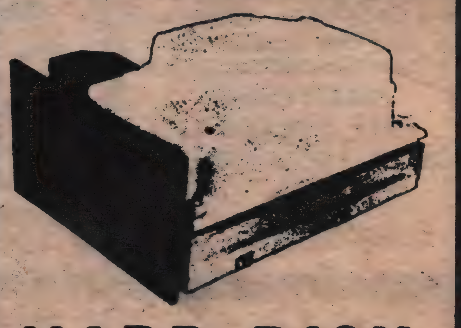

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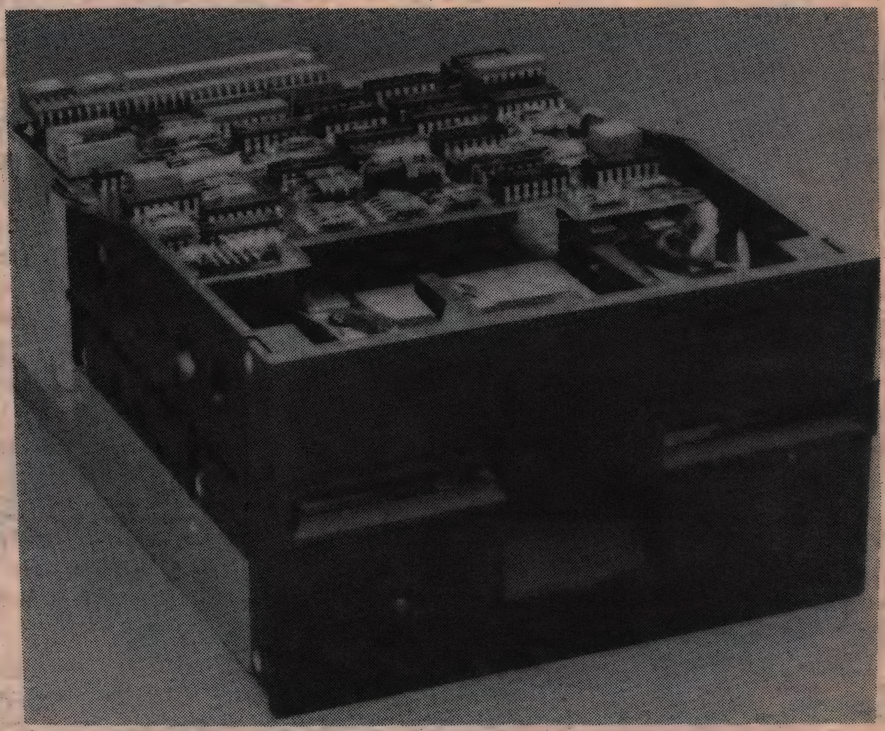

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SOFTWARE SHOPPING LIST

NAME: dB GENERAL LEDGER
TYPE: Accounting
COMPUTER: IBM PC or Compatible, Superbrain, Digilog, Toshiba
DESCRIPTION: A full featured accounting General Ledger program written in dBASE II with various printouts including audit reports, trial balance, balance sheet, income statement, department income statement, transactions listing, and chart of accounts listing. Operates on either floppy or hard disk systems. Can be used with multiple companies and most printers. Source code and manual provided. dBASE II required.
PUBLISHER: Texhoma Computers, 238 Blair House, Wichita Falls, TX 76306.
COST: $295.00

NAME: UNDERSTAND YOURSELF
TYPE: Self-help program
COMPUTER: Available for all computers
DESCRIPTION: Understand Yourself is a series of tests designed to help you to determine the "real you". Based on the book "Test Yourself", by Dr. Harry Gunn, the several programs which compose this package are designed to disclose your character. The computer does all the scoring. A full set of directions is built into each test and messages appear at the bottom of the screen whenever you are required to do something.
PUBLISHER: Dynacomp, Inc., 1064 Gravel Road, Webster, NY, 14580, (716) 671-6160
COST: $19.95 per diskette

NAME: NATIONAL FLAGS
TYPE: Educational program
COMPUTER: Atari
DESCRIPTION: National Flags is a colorful and entertaining way to be introduced to the national flags of nations across the world. With this program you can display a flag plus a world map on the screen and read the accompanying information about the nation's currency, capital and population. The world list, including 168 different nations, will challenge even the most advanced student of geography.
PUBLISHER: Dynacomp, Inc., 1064 Gravel Road, Webster, NY, 14580, (716) 671-6160.
COST: $25.95 for Cassette and $29.95 for Diskette

NAME: BELLY BUDDY WL
TYPE: Weight loss program
COMPUTER: Apple II, Apple II + , Apple IIe and Apple IIc with Applesoft DOS 3.3
DESCRIPTION: Bellly Buddy for Weight Loss was designed for the individual wishing to lose weight sensibly. Goals are set, R.D.A. established and progress recorded for up to 5 years. Calories, carbohydrate grams and protein as well as 13 other nutrients are computed and compared to user's R.D.A. to show deficiencies and surpluses. Data base consists of 425 food items including McDonald's (R) menu with user expansion of 25 items.
PUBLISHER: New Found Software, 9040 Aileen Drive, Mentor, OH, 44060.
COST: $28.95 plus $2.00 for shipping and handling.

NAME: JOURNAL
TYPE: Life's happenings program
COMPUTER: Apple II, Apple II + , Apple IIe and Apple IIc with Applesoft DOS 3.3.
DESCRIPTION: Journal allows you to make a permanent record of your life's happenings with total privacy. It contains an Appointment Calendar that reminds you of important events before they happen. You can keep your Journal forever private since only you know your secret password.
PUBLISHER: New Found Software, 9040 Aileen Drive, Mentor, OH, 44060.
COST: $15.95 plus $2.00 shipping and handling.

NAME: TRANSYLVANIA
TYPE: Entertainment game program
COMPUTER: IBM PC version requires 128K, color graphics adaptor, DOS, and Basic. It is PCjr compatible. Available for the Apple II, II + , IIe, IIc with single - res graphics on one side of the disk, and special double - res graphics on the other. There is a combined Commodore 64/Atari version. Also available for MacIntosh.
DESCRIPTION: Enter the spine-tingling world of Antonio Antiochia's Transylvania. Can the player rescue the fair Princess Sabrina from the diabolical Vampire? He'll match wits with the Werewolf, try to avoid untimely death in the perilous Transylvanian forests, discover what treasure or horror lies in the castle tower, and much, much more ... He'll have to be quick, though, for Sabrina dies at dawn!!!
PUBLISHER: Penguin Software, 830 Fourth Avenue, P. O. Box 311, Geneva, IL 60134, (312) 232-1984.
COST: IBM PC version and Apple version - $34.95, Commodore 64/Atari version - $34.95, MacIntosh version - $39.95

NAME: DISK REPAIR KIT
TYPE: Utility software program
COMPUTER: DOS 3.3 on the Apple II, II + , IIc, and IIc. A minimum of 48K and one disk drive are required.
DESCRIPTION: Disk Repair Kit is the program that breathes life into departed disks! When a disk expires, Disk Repair Kit can resuscitate the lost information, even on disks that appear lifeless. Other useful features of this new utility include the ability to selectively format tracks, maps used or bad sectors on a disk, and search disks for strings or patterns of bytes.
PUBLISHER: Penguin Software, 830 Fourth Avenue, P. O. Box 311, Geneva, IL 60134, (312) 232-1984.
COST: $29.95.

NAME: SCHOOL LEDGER-REPORT SYSTEM
TYPE: Accounting program
COMPUTER: TRS-80, Model III and IV
DESCRIPTION: School Ledger-Report System allows the elementary, junior high and high school bookkeeper to maintain activity-fund transactions on diskette, and prints detailed monthly and year-to-date reports. The current balance of all school accounts, and complete records of school transactions, are easily accessible. The program is sold with a 76-page manual.

PUBLISHER: Shenandoah Software, P. O. Box 776, Harrisonburg, VA, 22801, (703) 433-9485.
COST: $179.00

NAME: COMPUTERIZED ATLAS
TYPE: Educational program
COMPUTER: IBM PC (or compatible), PC-DOS 2.0 (or higher), 128 K of RAM and one disk drive. Available soon for the Apple MacIntosh
DESCRIPTION: Computerized Atlas displays the world globe in 3-D (perspective) and four colors. Facts about any indicated point or area on the globe: size, language, population, latitude, longitude and more - including the distance between two points, is available.
PUBLISHER: Software Concepts, Inc., 1116 Summer Street, Stamford, CT., 06905, (203) 357-0522.
COST: $69.95.

NAME: NFL CHALLENGE
TYPE: Entertainment game program
COMPUTER: IBM PC, PCjr and compatibles
DESCRIPTION: For the football lover, NFL CHALLENGE is the game for you. Real rosters and strengths of the NFL teams are used. With full animation, the game is played until the final gun. The two players select offenses and defenses and play a game of football against the clock.
PUBLISHER: XOR Corp., a Minnesota-based software house.
COST: $95.00

NAME: QUARTET
TYPE: Integrated accounting system program
COMPUTER: Tandy 1000, 1200HD, and 2000. It requires two drives and 256K RAM.
DESCRIPTION: Quartet includes the four major functions of an accounting system: Payables, Receivables, Payroll, and General Ledger. What makes it so special? The user interface. When you're entering payroll, the screen is a timecard. When you're paying bills, you're filling out checks. The receivable input is done on a screen invoice form. When you fill in one side of the ledger, Quartet brings up the proper balancing account and completes the entry.
PUBLISHER: Tandy Corporation, 1700 One Tandy Center, Fort Worth, TX, 76102, (817) 390-3549.
COST: $399.95.

NAME: TYSON EDUCATION SYSTEM
TYPE: Three-part educational system
COMPUTER: Apple II, II + , IIe, and IIc
DESCRIPTION: This three-part program consists of COUNTDOWN, an educational game, a TEST SIMULATOR to administer tests, an AUTHORING SYSTEM for writing and storing questions and tutorials on disk, plus a management system for storing, averaging and printing student results. The three programs are written in BASIC and feature easy-to-read and follow menus, eliminating the need for hard to understand manuals.
PUBLISHER: Tyson Educational Systems, Inc., P. O. Box 2478, Miami, FL 33055.
COST: $49.95.

Software Shopping List

Continued from page 220

NAME: AVA

TYPE: Portfolio management system

COMPUTER: IBM PC, PCjr, PC/XT, and PC/AT

DESCRIPTION: AVA is a portfolio management package for tracking stocks, bonds, mutual funds, options, futures, and other investments.

PUBLISHER: Market Maker Investment Software, 55 Sutter Street, Suite 26, San Francisco, CA, 94104, (415) 943-1945.

COST: $395.00.

NAME: HOME APPLICATIONS AND GAMES FOR THE COMMODORE 64

TYPE: This book features an assortment of 31 programs for the Commodore 64. Twenty-one useful application programs (like Budget Power, Car Ownership, and Tax Deduction Recorder) supply practical, money-saving ways to use the micro as a home management tool. Ten exciting new game programs (including Bridge Buster, .44 Magnum, and Beowulf vs. Grendel). Each of the fully-coded programs is introduced with a complete description of its function, a line-by-line explanation of "How the Program Works" and a "String and Numeric Variables" table. So, readers can simply type in each of the programs and run as is; or, since they know exactly how each program works, modify a given program for their own uses.

PUBLISHER: Little, Brown and Company, College Division, 34 Beacon Street, Boston, MA, 02106, (617) 227-0730.

COST: $14.50

NAME: GROWING WITH GAMES

TYPE: Teacher-written educational software

COMPUTER: Apple II, IIe and IIc

DESCRIPTION: "Growing with Games" includes a variety of twelve new programs for age groups from two through sixteen. Reading comprehension programs, "Clock" for teaching the pre-school child how to read a conventional clock, and "Wordplay" and "Memory Match", programs that concentrate on word recognition, language, arts and spelling skills, are three examples of the types of programs available with "Growing with Games".

PUBLISHER: Hartley Courseware, Box 419, Dimondale, MI, 48821, 1-800-247-1380.

NAME: TELESCAPE

TYPE: Communications software package with graphics

COMPUTER: MacIntosh

DESCRIPTION: Telescape features an integrated communications directory, intelligent macros, universal terminal emulation, error-checking file transfer and an unattended message service. Telescape's most innovative feature is its graphics language and display capability. Even simple animation can be accomplished.

PUBLISHER: Mainstay, 28611B Canwood Street, Agoura Hills, CA, 91301, (818) 991-6540.

COST: $125.00

NAME: MASTERFORTH

TYPE: State-of-the-art implementation of the Forth programming language.

COMPUTER: MacIntosh, IBM PC, Apple II series, CP/M, and the Commodore 64.

DESCRIPTION: MasterForth provides a complete programming enviroment, including a 68000 macro-assembler and support for the mouse, the finder, menus, and the graphics tool box. Relocatable utilities and transient definitions make it possible to run substantial software packages even on a 128K MacIntosh. The string package and resident debugger are standard features.

PUBLISHER: Micromotion, 12077 Wilshire Blvd., No. 506, Los Angeles, CA, 90025, (213) 478-7398.

COST: $125.00.

NAME: ENABLE

TYPE: Integrated Microsoftware System

COMPUTER: IBM PC and selected compatibles

DESCRIPTION: Enable combines sophisticated word processing; a full-function spreadsheet comparable to 1-2-3; presentation-level graphics; state-of-the-art telecommunications; and a powerful DBMS with paint-the-screen forms design, data entry with extensive validation, powerful yet easy search and retrieval, and customized report generation.

PUBLISHER: The Software Group, Northway Ten Executive Park, Ballston Lake, NY, 12019, (518) 877-8600.

COST: $695.00

NAME: JOB COST SYSTEM

TYPE: Business accounting system

COMPUTER: Columbia MPC, COMPAQ Portable Computer, Corona PC, DEC Rainbow, Eagle 1600, Eagle PC, IBM PC, IBM PC XT, Texas Instruments Professional Computer, Zenith Z-100 and Zenith Z-150.

DESCRIPTION: Job Cost System provides the small business with a reliable means of tracking actual vs. estimated costs and measuring profitability on a job-by-job basis. It has been successful at controlling costs and improving performance for general and sub-contractors, job shops, maintenance services, landscapers, architects, engineers, ad agencies and many other professionals.

PUBLISHER: Automation Consultants, 610 Santa Cruz Avenue, Suite 204, Menlo Park, CA, 94025, (415) 326-4031.

COST: $595.00.

NAME: CROSSAVE

TYPE: Software Package

COMPUTER: IBM XT. Requires a 16-bit CPU (8088 and up), 64K of RAM, and a floppy diskette and Winchester Drive. Available for both DOS 2.0 or CP/M 86.

DESCRIPTION: Crossave provides the only practical means on the market to copy/restore data from/to Winchester disks and floppy diskettes when a file is larger than the capacity of the diskette. Crossave offers the following features: automatic volum management that ensures proper execution; selective file backup/restore and bulk backup restore; compression to reduce the amount of space required for storage on the diskette and expansion to return it to normal size when transferred back to the Winchester; ease of use via the display of file directories of both disk and diskette on the same screen; and, high speed transfer by extensive use of read/write buffers.

PUBLISHER: Award Software, Inc., 236 North Santa Cruz Avenue, Los Gatos, CA, 95030, (408) 395-2773.

COST: $99.00

NAME: CROSS-CHEX

TYPE: Software test system package

COMPUTER: IBM and IBM PC

DESCRIPTION: Cross-Chex is a menu-driven test system of hardware functions that solves the problem of haphazard maintenance. By periodically checking out the performance levels of floppy disk drives, the risks of data loss can be reduced. Cross-Chex validates sectors on Winchester disks, certifies main and video memory, and provides keyboard and printer diagnostics. Cross-Chex enables the user to insure the performance of his computer, maximize his uptime, and maintain his data's integrity.

PUBLISHER: Award Software, Inc., 236 N. Santa Cruz Avenue, Los Gatos, CA, 95030, (408) 395-2773.

COST: $99.00.

NAME: TRUST EXEC

TYPE: Trust Accounting/Checkbook program

COMPUTER: IBM and compatible computers

DESCRIPTION: Trust Exec., a "single entry" program, takes any transaction entered by the operator, either a check, deposit, or account adjustment, and immediately posts the transaction to the Checkbook Register, Clients Ledger, and updates both the checking account balance as well as the individual client ledger balance. Trust Exec. is less susceptible to errors, less expensive, and more than twice as fast to maintain than its manual counterpart.

PUBLISHER: Data Source One, Inc., 1720 W. Buffalo Avenue, Tampa, FL, 33607, (813) 875-1001.

COST: $399.95.

NAME: SOLO

TYPE: Investment and Portfolio analysis software program

COMPUTER: IBM PC (128K memory), and CP/M systems (64K memory). Needs one disk drive.

DESCRIPTION: Solo is a do-it-yourself software package that puts the power of your computer to work in analyzing your personal portfolio of investments. You may use Solo to do your after tax analysis of individual investments, or for your portfolio as a whole.

PUBLISHER: Financiometrics, Inc., P. O. Box 1788, Lafayette, CA 94549, (415) 376-9455.

COST: $90.00.

NAME: "REACH FOR A TEACHER" FLIPTRACK LEARNING SYSTEMS

TYPE: Step-by-step courses for Apple computers' users

COMPUTER: Apple IIe, Apple II + , and Apple III

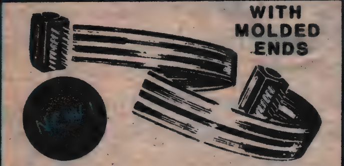
DESCRIPTION: "Reach for a Teacher" is a learn-by-doing audio cassette course that guides you through the basic functions of the Apple computer into confident operation of the full range of capabilities, such as how useful color, sound, and graphics may be.

PUBLISHER: FlipTrack Learning Systems, 999 Main, Suite 200, Glen Ellyn, IL, 60137, (312) 790-1117.

L-COM® Shopper's Guide

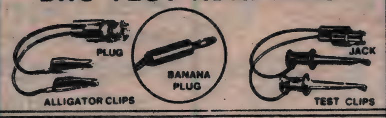
Products for the ELECTRONIC & COMPUTER Industry

SUPERIOR GRADE DIP-16 FLAT CABLES



MODEL-ft.	1-9	10-24	25
MLF16PP-0.5	3.30	3.00	2.84
MLF16PP-1	3.60	3.28	3.10
MLF16PP-2	4.20	3.82	3.61
MLF16PP-3	4.80	4.37	4.13
MLF16PP-4	5.40	4.91	4.64

BNC TEST ADAPTERS



MODEL	TYPE	TERMINATION	1-9
BC30	Plug	Banana Plug	7.75
BC40	Plug	Test Clip	8.95
BC50	Plug	Alligator	7.10
BC60	Jack	Banana Plug	5.75
BC70	Jack	Test Clip	6.95
BC80	Jack	Alligator	5.75

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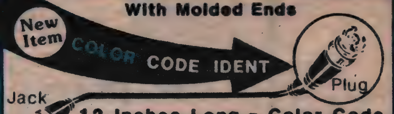

12 Inches Long - Color Code

RG58C/U MODEL-Color	3.87/10 3.66/25	RG59B/U MODEL-Color
CC58CX-Blue	$4.25 Each	CC59BX-Blue
CC58CX-Green		CC59BX-Green
CC58CX-Orange		CC59BX-Orange
CC58CX-Yellow		CC59BX-Yellow

Color Mix OK for Quantity Pricing

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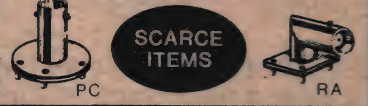

MODEL	TYPE	1-9	10-24	25
BAC-1422	PC	4.95	4.50	4.26
BAC-1500	RA	7.95	7.23	6.84

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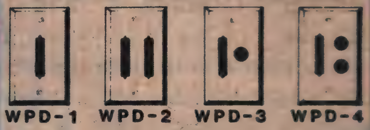
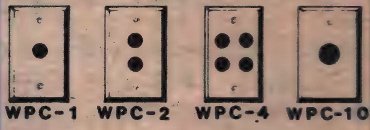


MODEL	Knockout	1-9	10-24
WPD-1	(1) D-25	3.95	3.75
WPD-2	(2) D-25	3.95	3.75
WPD-3	D & Coax	3.95	3.75
WPD-4	D & Coax	3.95	3.75

COAXIAL WALL PLATES



WPC-1	(1) Coax	3.95	3.75
WPC-2	(2) Coax	3.95	3.75
WPC-4	(4) Coax	3.95	3.75
WPC-10	IBM Twinax	3.95	3.75

NOTICE: Wall plates have D-Holes to accept feedthru adapters as shown below. Prices are for plates only.

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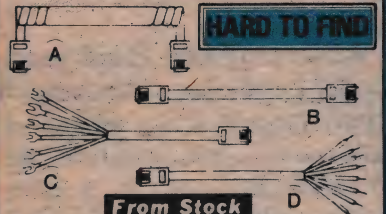
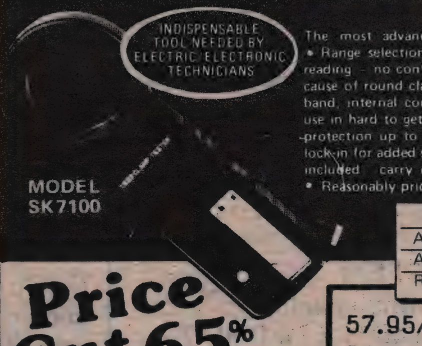


From Stock

MODEL-ft.	Code	# Wires	1-9	10-24
TDC-001-6	A	8	3.95	3.48
TDC-001-10	A	8	4.95	4.36
TDC-003-2	B	8	2.95	2.60
TDC-003-7	B	8	3.55	3.12
TDC-003-14	B	8	4.85	4.27
TDC-003-25	B	8	6.95	6.12
TDC-027-7	B	6	2.95	2.60
TDC-027-14	B	6	3.85	3.39
TDC-027-25	B	6	4.95	4.36
TDC-004-7	C	8	2.95	2.60
TDC-004-14	C	8	3.95	3.48
TDC-028-7	C	6	2.55	2.24
TDC-028-14	C	6	3.45	3.04
TDC-005-2	D	8	2.25	1.98
TDC-005-7	D	8	2.95	2.60
TDC-005-14	D	8	3.95	3.48

Rotary-Scale Clamp-On Instruments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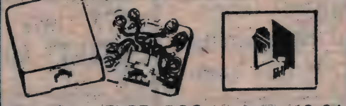

MODEL	TYPE	POS.	1-9	10-24
TDD-22	Wall	8	7.50	6.60
TDD-26	PC	6	2.95	2.60
TDD-28	PC	8	3.95	3.48

MALE D-SUB HARDWARE

STD 4-40 SET

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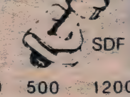

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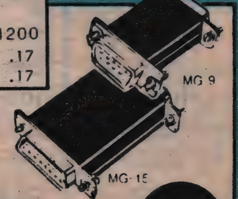
MODEL	FINISH	50-450	500	1200
SDF-1	Chromate	.19	.18	.17
SDF-2	Tin Plate	.19	.18	.17

COMPARE



GENDER CHANGERS

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MODEL	GENDER	1-9	10-24
MG-9F	F-F	15.95	14.51
MG-9M	M-M	15.95	14.51
MG-15F	F-F	18.95	17.24
MG-15M	M-M	18.95	17.44

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DS22B	DPDT AB	BNC	79.00
*DS22BT	DPDT AB	BNC-TNC	85.00
DS13B	SPDT ABC	BNC	75.00
DS23B	DPDT ABC	BNC	94.00
*DS23BT	DPDT ABC	BNC-TNC	99.00

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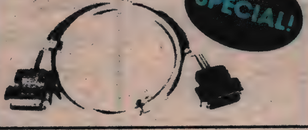

MODEL-ft.	1-9	10-24
C25-2.5	19.88	18.09
C25-5	21.16	19.26
C25-10	23.76	21.62
C25-15	26.36	23.99
C25-25	31.56	28.72

SPECIFY: Male-Male or Male-Fem

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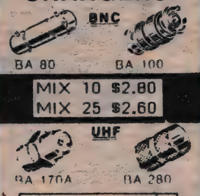

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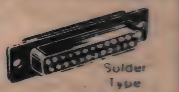
CONNECTORS FOR L-COM WALL PLATES

MODEL	TYPE	1-9	10-24
BA-1087	BNC	6.25	5.94
BA-2301	TNC	6.45	6.13

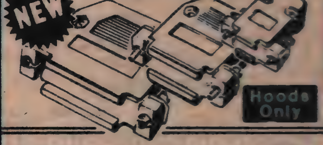
RS-232 D-SUBS



SD-25P2	Male	3.65	3.47
SD-25S2	Female	4.85	4.61

METALIZED CONNECTOR

REDUCE EMI



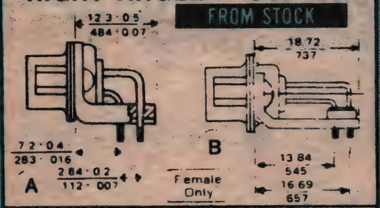
Shielded plastic shell meet FCC's Class B. Solves interference problems. Designed to reduce the cost and weight. The compucable shell is made of fire resistant plastic (UL94VO) and is plated with copper for shieldeing and then with nickel: **All hardware included**

MODEL-SIZE	1-9	10-24	25
SDC- 9M	1.75	1.66	1.54
SDC- 15M	1.85	1.76	1.63
SDC- 25M	1.95	1.85	1.72

Supplied w/hdr - QTY pricing also

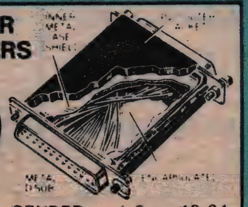
RIGHT ANGLE D-SUB 25

FROM STOCK



MODEL	TYPE	1-9	10-24	25
SD25S-RA	A	7.90	7.51	6.95
SD25S-R2	B	7.90	7.51	6.95

GENDER CHANGERS

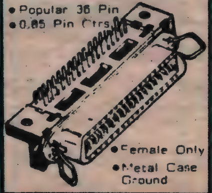


MODEL	GENDER	1-9	10-24
MG-25F	F-F	23.95	21.79
MG-25M	M-M	23.95	21.79

ATTRACTIVE Prices for QTY Users

CENTRONICS RT ANGLE PC CONNECTOR

- Popular 36 Pin
- 0.85 Pin Ctrs



SCARCE ITEM

CEN36F-RA

1-9	10-24	25
8.95	7.88	8.50

DEALER REQUESTS ATTENDED

RG59B COAX CABLES with UHF Connectors on both ends

MODEL-ft.	1-9	10-24	25-99
CB59B-1	3.55	3.23	3.05
CB59B-1.5	3.70	3.37	3.18
CB59B-2	3.85	3.50	3.31
CB59B-3	4.15	3.78	3.57
CB59B-4	4.45	4.05	3.83
CB59B-5	4.75	4.32	4.09
CB59B-10	6.25	5.69	5.38
CB59B-15	7.75	7.05	6.67
CB59B-25	10.75	9.78	9.25
CB59B-50	18.25	16.61	15.70
CB59B-100	33.25	30.26	28.60

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C-2

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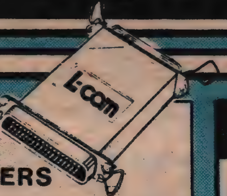
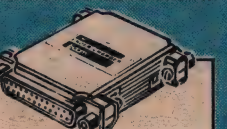


PARALLEL (Centronics) GENDER CHANGERS

Mates Centronics parallel printer cables that are of the wrong sex. All 36 pins are wired through. Sturdy metal shield construction. — **Mating Centronics cables are also available**

MODEL	Gender	1-9	10-24
DGS-36F	Female - Female	36.95	33.62
DGS-36M	Male - Male	36.95	33.62



RS-232 GENDER CHANGERS

Needed when RS-232 cables won't mate. Our DG Series are compact and feature trouble free PC Board construction and lower cost. Choice of shielded or unshielded. Always keep some for emergency needs. 25 up quantity pricing available.

MODEL	Gender	1-9	10-24
DG-25F	(F-F)Unshielded	16.95	15.42
DG-25M	(M-M)Unshielded	16.95	15.42
DGS-25F	(F-F)Shielded	18.95	16.97
DGS-25M	(M-M)Shielded	18.95	16.97

RS-232 DATA LINE MONITOR

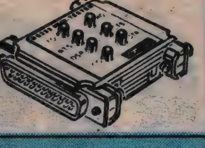
A miniature **Data Line Monitor** allows the user to determine the status of the seven key signals of the RS-232 data path. All 25 pins wired through, and Red LED's report the status of:

Transmit Data (TD) pin 2
Receive Data (RC) pin 3
Request To Send (RTS) pin 4
Clear To Send (CTS) pin 5
Data Set Ready (DSR) pin 6
Data Carrier Detect (DCD) pin 8
Data Terminal Ready (DTR) pin 20

MODEL	Description	1-9	10-24
DLM	Data Line Monitor	37.35	33.99

NEW Data Line Monitor now available with Red/Green LED's to indicate a Low, high or open position.

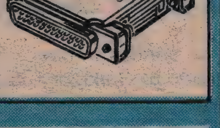
MODEL	Description	1-9	10-24
DLM-2	Data Line Monitor	46.95	42.72



RS-232 SURGE PROTECTOR

Guard against voltage spikes entering your RS-232 ports. Metal-Oxide varisitors on lines 2, 3, and 7 clamp surges above 26 volts without affecting normal operating condition. This compact adapter mounts permanently in series, all 25 wires are wired through.

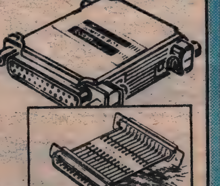
MODEL	Description	1-9	10-24	25-99
DSP	Surge Protector	24.95	22.70	19.96



RS-232 DATA JUMPER BOX

A **Data Jumper Box** used to customize RS-232 interface devices. All 25 pins of the male and female connectors terminate to 25 solder pads. The PC Board is always wired to the D-Subs. Supplied with 25 wires already stripped for permanent wiring to suit your needs. Many interfaces could be built - Null Modems, Pin Reversers, - You name it!! Supplied with all hardware unassembled.

MODEL	Description	1-9	10-24	25-99
DJB	Jumper Box	22.45	20.43	17.96

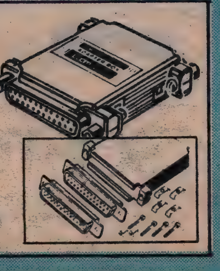


RS-232 DO IT YOURSELF KIT

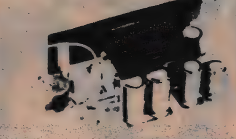
This **Do It Yourself Kit** allows the creation of many RS-232 variations. The following components are included in the assortment:

1 ea.	Male 25 pin D-Sub Connector
1 ea.	Female 25 pin D-Sub Connector
2 ea.	Snap-on half covers (UL 94VO)
1 set	Hardware for Male & Female Connectors

MODEL	Description	1-9	10-24	25-99
DIY	Do It Yourself Kit	13.65	12.42	10.92

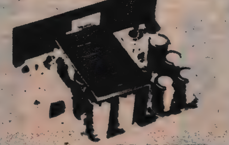


THIS MONTH'S SPECIAL



30 WATT

SAVE 50%



50 WATT

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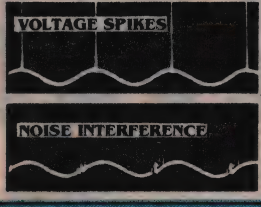
- Built-in EMI Filter
- Fused Input
- Converter Freq. 25 kHz
- 70% Efficiency
- Overload Protection (Auto recovery)
- Output Converter incl.

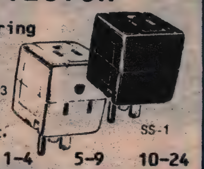
SPECIFICATIONS:
- Input: 115V or 230VAC
- Line regulation: ±0.15%
- Load regulation: ±1.0% max.
- Ripple & Noise: 1.0% max.
- Oper. Temp: 0° - +40°C
- Holdup Time: 25 millisec.
- Size: 30W - 2.17 X 3 X 5.92
  50W - 2.17 X 3.95 X 5.6

30 WATT		30W	Qty.	50W	50 WATT	
MODEL	DC Volt-Amp	38.94	1-9	52.14	MODEL	DC Volt-Amp
0506	5V @ 6A	35.40	10-24	47.50	0510	5V @ 10A
122R5	12V @ 2.5A	32.45	25-99	43.45	1204	12V @ 4A
1502	15V @ 2A	29.50	100	39.50	153R25	15V @ 3.25A
241R25	24V @ 1.25A	MIXING ALLOWED			2402	24V @ 2A

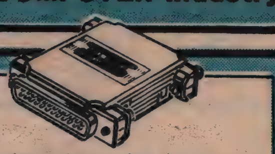
AC LINE TRANSIENT SURGE PROTECTOR



- Prevents False Triggering
- Absorbs Spike & Noise
- Safe Voltage Level
- 2-Step Protection
- Rated: 15A @ 125VAC
- Polarized Gnd'd Recept.



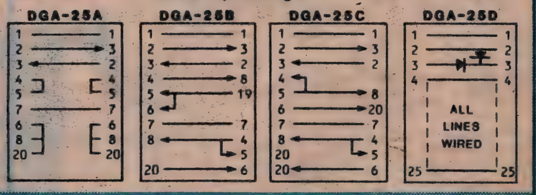
MODEL	# TAPS	1-4	5-9	10-24
SS-1	Single	10.95	9.75	8.65
SS-3	3-Way	12.65	11.26	9.99



RS-232 MODEM ADAPTERS

Eliminate need for modems when connecting local terminals or terminal to computer. Construction is the same as our DG Series. Pin connectors are shown in our code diagrams. If our standard won't do, we will configure to your specifications.

MODEL	Description	1-9	10-24
DGA-25A	Null Modem	16.95	15.42
DGA-25B	Null Modem	16.95	15.42
DGA-25C	Null Modem	16.95	15.42
DGA-25D	Polarity Changer	16.95	15.42



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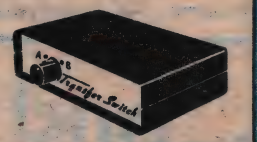
- RFI Safety Proof
- Brushed Aluminum Panel
- Highest Grade Rotary Sw.
- 6 LED Monitor, Optional
- Size: 2.25" X 7.25" X 5"
- Full One Year Warranty



RS-232 12 Lines Switched		1-4	5-9
DTS2512-2	2-Way	99.00	94.05
DTS2512-3	3-Way	115.00	109.25
Switches - Lines: 2-6, 8, 15, 17, 20, 24, 25			
RS-232 25 Lines Switched			
DTS2525-2	2-Way	115.00	109.25
DTS2525-3	3-Way	130.00	123.50
CENTRONICS 25 Lines Switched			
DTS3625-2	2-Way	155.00	147.25
DTS3625-3	3-Way	175.00	166.25
Switched - Lines: 1-6, 18, 31-36, 19-30			
6 LED Monitor (Lines 2-6 & 20) Add 15.00			

L-com BNC COAXIAL CABLES ... FROM STOCK!

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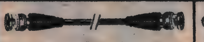
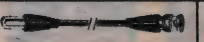
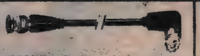


MODEL-Ft	1-9	10-24
CC58C-1	3.55	3.23
CC58C-1.5	3.70	3.37
CC58C-2	3.85	3.50
CC58C-2.5	4.10	3.73
CC58C-4	4.40	4.00
CC58C-5	4.65	4.23
CC58C-10	6.05	5.51
CC58C-15	7.45	6.78
CC58C-25	10.75	9.33
CC59B-1	3.65	3.32
CC59B-2.5	4.00	3.64
CC59B-5	4.75	4.32
CC59B-10	6.25	5.69
CC59B-15	7.75	7.05
CC59B-25	10.75	9.78
CC59B-50	18.25	16.61
CC59B-100	33.25	30.26
CC62A-1	3.60	3.28
CC62A-2.5	3.95	3.59
CC62A-5	4.70	4.28
CC62A-10	6.15	5.60
CC62A-15	7.60	6.92
CC62A-25	10.50	9.56
CC62A-50	17.75	16.15
CC62A-100	32.25	29.35
CC174-1	3.60	3.28
CC174-1.5	3.75	3.41
CC174-2	3.90	3.55
CC174-2.5	4.05	3.69
CC174-4	4.50	4.10
CC174-5	4.80	4.37
CC174-10	6.35	5.78
CC174-15	7.90	7.19
CC174-25	11.00	10.01

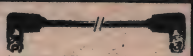


MODEL-Ft	1-9	10-24
RG-58C EXTENSION CABLES NOT STOCKED BUT MADE TO ORDER		
Shorter Lengths Made To Order		
CC59BX-5	4.95	4.50
CC59BX-10	6.45	5.87
CC59BX-15	7.95	7.23
CC59BX-25	10.95	9.96
CC59BX-50	18.45	16.79
CC62AX-5	4.90	4.46
CC62AX-10	6.35	5.78
CC62AX-15	7.80	7.10
CC62AX-25	10.70	9.74
CC62AX-50	17.95	16.33
CC62AX-100	32.45	29.53
RG-174 EXTENSION CABLES NOT STOCKED BUT MADE TO ORDER		



MODEL-Ft	1-9	10-24
CC58C-1RA	4.90	4.46
CC58C-1.5RA	5.05	4.60
CC58C-2RA	5.20	4.73
CC58C-2.5RA	5.35	4.87
CC58C-3RA	5.50	5.00
CC58C-4RA	5.80	5.28
CC58C-5RA	6.10	5.55
CC58C-7.5RA	6.85	6.23
CC58C-10RA	7.60	6.92
CC59B-1RA	4.90	4.46
CC59B-1.5RA	5.05	4.60
CC59B-2RA	5.20	4.73
CC59B-2.5RA	5.35	4.87
CC59B-3RA	5.50	5.00
CC59B-4RA	5.80	5.28
CC59B-5RA	6.10	5.55
CC59B-7.5RA	6.85	6.23
CC59B-10RA	7.60	6.92
CC62A-1RA	4.90	4.46
CC62A-1.5RA	5.05	4.60
CC62A-2RA	5.20	4.73
CC62A-2.5RA	5.35	4.87
CC62A-3RA	5.50	5.00
CC62A-4RA	5.80	5.28
CC62A-5RA	6.10	5.55
CC62A-7.5RA	6.85	6.23
CC62A-10RA	7.60	6.92
CC174-1RA	4.90	4.46
CC174-1.5RA	5.05	4.60
CC174-2RA	5.20	4.73
CC174-2.5RA	5.35	4.87
CC174-3RA	5.50	5.00
CC174-4RA	5.80	5.28
CC174-5RA	6.10	5.55
CC174-7.5RA	6.85	6.23
CC174-10RA	7.60	6.92

MODEL-Ft	1-9	10-24
CC58CX-1RA	5.10	4.64
CC58CX-1.5RA	5.25	4.78
CC58CX-2RA	5.40	4.91
CC58CX-2.5RA	5.55	5.05
CC58CX-3RA	5.70	5.19
CC58CX-4RA	6.00	5.46
CC58CX-5RA	6.30	5.73
CC58CX-7.5RA	7.05	6.42
CC58CX-10RA	7.80	7.10
CC59BX-1RA	5.10	4.64
CC59BX-1.5RA	5.25	4.78
CC59BX-2RA	5.40	4.91
CC59BX-2.5RA	5.55	5.05
CC59BX-3RA	5.70	5.19
CC59BX-4RA	6.00	5.46
CC59BX-5RA	6.30	5.73
CC59BX-7.5RA	7.05	6.42
CC59BX-10RA	7.80	7.10
CC62AX-1RA	5.10	4.64
CC62AX-1.5RA	5.25	4.78
CC62AX-2RA	5.40	4.91
CC62AX-2.5RA	5.55	5.05
CC62AX-3RA	5.70	5.19
CC62AX-4RA	6.00	5.46
CC62AX-5RA	6.30	5.73
CC62AX-7.5RA	7.05	6.42
CC62AX-10RA	7.80	7.10
CC174X-1RA	5.10	4.64
CC174X-1.5RA	5.25	4.78
CC174X-2RA	5.40	4.91
CC174X-2.5RA	5.55	5.05
CC174X-3RA	5.70	5.19
CC174X-4RA	6.00	5.46
CC174X-5RA	6.30	5.73
CC174X-7.5RA	7.05	6.42
CC174X-10RA	7.80	7.10



MODEL-Ft	1-9	10-24
CC58C-1RA2	6.25	5.69
CC58C-1.5RA2	6.40	5.82
CC58C-2RA2	6.55	5.96
CC58C-2.5RA2	6.70	6.10
CC58C-3RA2	6.85	6.23
CC58C-4RA2	7.15	6.51
CC58C-5RA2	7.45	6.78
CC58C-7.5RA2	8.20	7.46
CC58C-10RA2	8.95	8.14
CC59B-1RA2	6.25	5.69
CC59B-1.5RA2	6.40	5.82
CC59B-2RA2	6.55	5.96
CC59B-2.5RA2	6.70	6.10
CC59B-3RA2	6.85	6.23
CC59B-4RA2	7.15	6.51
CC59B-5RA2	7.45	6.78
CC59B-7.5RA2	8.20	7.46
CC59B-10RA2	8.95	8.14
CC62A-1RA2	6.25	5.69
CC62A-1.5RA2	6.40	5.82
CC62A-2RA2	6.55	5.96
CC62A-2.5RA2	6.70	6.10
CC62A-3RA2	6.85	6.23
CC62A-4RA2	7.15	6.51
CC62A-5RA2	7.45	6.78
CC62A-7.5RA2	8.20	7.41
CC62A-10RA2	8.95	8.14
CC174-1RA2	6.25	5.69
CC174-1.5RA2	6.40	5.82
CC174-2RA2	6.55	5.96
CC174-2.5RA2	6.70	6.10
CC174-3RA2	6.85	6.23
CC174-4RA2	7.15	6.51
CC174-5RA2	7.45	6.78
CC174-7.5RA2	8.20	7.41
CC174-10RA2	8.95	8.14

MOLDED DIP-16 CABLES All Fully Populated - 16 Conductor

ML16PS
ML16P
ML16S
ML16PP
ML16PSS
ML16PPC
ML16PSC

MODEL-Ft.	Gender	1-9	10-24	25-99
ML16P-1	Male	3.95	3.59	3.40
ML16P-2	Male	4.25	3.87	3.66
ML16P-3	Male	4.55	4.14	3.91
ML16S-1	Female	3.95	3.59	3.40
ML16S-2	Female	4.25	3.87	3.66
ML16S-3	Female	4.55	4.14	3.91

*Coiled Cord 22" Unstretched

MODEL-Ft.	GENDER	1-9	10-24	25-99
ML16PP-1	M-M	6.85	6.23	5.89
ML16PP-2	M-M	7.15	6.51	6.15
ML16PP-3	M-M	7.45	6.78	6.41
ML16PS-1.5	M-F	6.95	6.32	5.98
ML16PSS-1.5	M-(2)F	11.45	10.42	9.85
ML16PSC-4*	M-F	8.95	8.14	7.70
ML16PPC-4*	M-M	8.95	8.14	7.70

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Publishers, Merchandisers,
and Business Users

CLASSIFIED

CLASSIFIED INFORMATION

CLASSIFIED AD RATES

The classifieds are for **Pre-Owned Items & Software ONLY.** New equipment, Services, etc. must use regular Display space.

Instructions

In order for us to keep the ad rate low and insure accuracy, it is necessary that the following procedures are followed.

1. Type or print your ad legibly on a plain sheet of paper. Ads received that are difficult to read will be returned.
2. **Write the desired category at the top of each ad. Please refer to the index, this page. If a category is not indicated, ad will be placed in the Miscellaneous section.**
3. If more than one ad is submitted, use a separate piece of paper for each ad, making sure your complete name and address is at the bottom of each ad.

CLOSING DATE — 2nd Monday of the month. Example: the closing date for June's Issue is the 2nd Monday of April. **Due to our low rates, you cannot change, cancel or receive a refund on classifieds after they are typeset.** In most cases, ads are typeset within a week after they are received.

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8 point line, $1.22 cents per line.
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Maximum of 15 characters per line.

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Ads running more than one time. A repeat ad will be coded at the end of the ad with the month ad started and issue ad ends. Example: 8-160. Ad started Aug. ends 160 issue or January. NOTE: Please check to make sure your ad has been correctly coded.

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Due to low classified rates a free checking copy or tear sheet cannot be sent if proof of insertion is desired, please send $3.00 extra.

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A photo will draw attention to your ad. Photos are $7.00 per column inch. Please send in B/W photos, preferable 4x5's cropped horizontally. Include your name and address on the back of **each** photo. If photo looks like it is more than one inch send in money for two inches or more.

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★★ **$4.00**

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It's a fact...unusual "artwork" in or above an ad draws attention that ad and the reader retains interest in that product longer.

GET RESPONSE QUICKER with "Stars" above your ad. Below is the rate for different sizes. Just mark "stars" and the price of the one you choose above your ad copy and we'll take care of the rest. Be sure to include the cost with your ad payment.

CS-ABBREVIATIONS

add-post	add postage
add-post-AP	add postage, all prices
FC	Freight Collect
MBG	money back guarantee
PP	postage paid
SASE	send self-addressed stamped envelope for check return or information requested
10 DRP	10 day return privilege
CCR	check clearance required

EXAMPLE OF STYLES:

Normal -

PDP 11/03 COMPUTER. Complete operating system with RT-11 system software plus basic. Brand new October '78. Sell complete at $7,000, or separate at: 11/03 Computer $900. Dual RX-1 disk $1,000. 32KB memory $2,800. VT-52 video $1,500. GE Terminet 30 printer $800. Intertube video terminal $400. **John Doe,** POB 1234, Somewhere, USA 00000. 123-456-7890.

10 Point Centered Head

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Individual Listings

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11/03 Computer	$900
Dual RZ-1 disc	$1,000
32KB memory	$2,800
Intertube video terminal	$400

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Address ______________________
City ______________________
State ______________ Zip ______________

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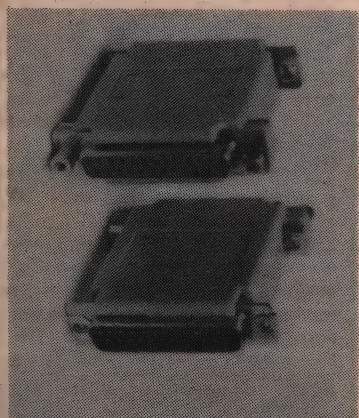

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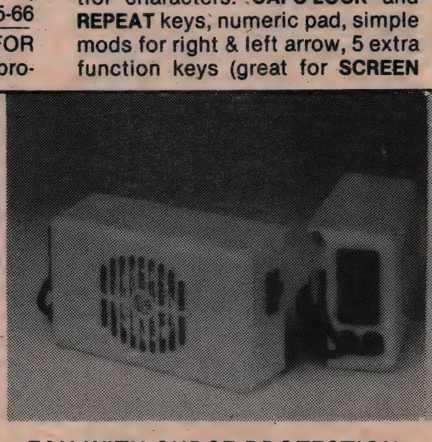

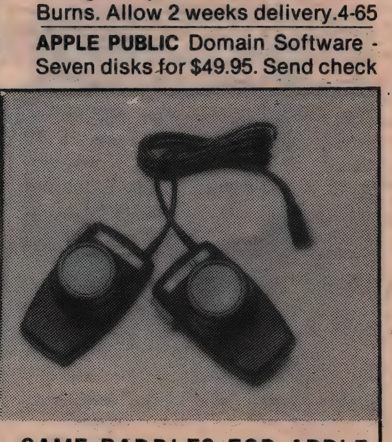

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FOR SALE– Three Timex/Sinclair 1000 Computers. 1) T/S 1000 with 2k Internal RAM, 16K RAM Pack, both in original boxes $40.00. 2) T/S 000 with 2k Internal RAM, 16k RAM Pack, $25.00. 3) T/S 1000 with 2k Internal Ram, 64k RAM Memory Expander, 2040 Printer with 6 rolls of paper, some tape programs, COMPUSA Disk Drive Controller, One SA-400 compatible disk drive, several disks, manuals, books, catalogs, and more. $150.00 One T/S 1000 Disk Interface Only plus 5 diskettes, $75.00. Contact **Gary L. Dickman,** Box 213, Pratt, Kansas 67124 316-672-3732.

(125A) SINCLAIR COMPUTERS WANTED

(125B) SINCLAIR SOFTWARE, PERIPHERAL

CASINO KENO. A great party game for any number of players. Like the Las Vegas Casinos with 80 number display. Player tries to guess what numbers the computer will select and marks his Keno tickets accordingly. Printer will print tickets or use tickets available. Players winnings depend on number of correct guesses. SASE for fact sheet or order Cassette No. 44 for TS1000 or Cassette No. 144 for TS2068. $19.95 plus $2 p&h to **Macshak Software,** 73-312 Ironwood St., Palm Desert, CA 92260.

FASTFILE Professional Data Management System. Best filing program for ZX81/TS1000/1500 or money back. Written in lightning fast 100% machine code. Sorts 1500 5-byte records in 24 seconds, 500 in 3 seconds! Searches through 1500 records in 1 second! Adds up 1500 decimal numbers in under 2 seconds. Built in word processor allows easy data entry. 4 data types stores more information in less memory. Add, change, delete, LPrint, search and query are all as easy as pointing your finger. Several different kinds of files can be in memory at the same time. Complete query system answers "How many...?", "How much...?", or "Which...?" type questions. Includes an example checkbook program which can store 400 checks in 16K! Manual includes information on how to create coupon/refund files, mailing labels, inventory control, address book, appointment schedular/calendar and your own files. To order send $19.95 plus $2 P&H for cassette and manual: **Tom E. Cole,** 1314 Speight #15, Waco, TX 76706. Texans add local tax.

FORTH T/S2068 learning development tool includes ROM links by service code, editor function. Easily extended by word or machine code. $14.95 PP. **Don McCabe,** 80 Norwood A2C, Norwalk, OH 44857.

FREE CATALOG Timex Sinclair Hardware and Software. Books Spectrum programs. QL information British Magazines. **Curry Computer,** 5344 West Banff, Glendale, AZ 85306, 602-978-2902. 5-67

FREE CATALOG Timex-Sinclair 1000, 1500, 2068 **Spectrum** Software and Hardware. Also books, magazines, etc. **QL** Books and Software in Stock. Large selection of spectrum programs for both 2068 with ROMSWITCH or Emulator. **Jet Set Willy** only $14.95! **DEUS EX MACHINA** 25.95! We always stock the top 10 spectrum programs. Send 20 cent stamp to **CURRY COMPUTER,** 5344 W. Banff, Glendale, AZ 85306 1-602-978-2902. MCI I.D. #126-7701 3-67

FREE PROGRAM for TS1000! Send SASE for listing & other product details! **JST Enterprises,** Rt. 1 Box 77, Brownsville, KY 42210. 3-64

FREE PROGRAM for TS1000! Send SASE for listing & other product details! **JST Enterprises,** Rt. 1 Box 77, Brownsville, KY 42210. 5-66

Print BANNERS with TS-2068 and 80-column printer with AERCO interface. $12 from **Jim Clatfelter,** PO Box 480, Somerset, CA 956844-65

QUALITY SOFTWARE, free catalog. TS1000, 1500, 2068. **Basically Programming,** Dept. C, 2528 W. Olive Avenue, Fullerton, CA 92633. 714-738-0666. 12-64

SINCLAIR SOFTWARE and hardware, books, magazines for all Sinclair and Timex Sinclair computers. **Free catalog. Micro Imports Ltd.,** 12416 N. 28th Drive Suite 18-251, Phoenix, AZ 85029. 2-66

SURVEY-BOUNDARY T/S 1000 16K basic. Covers bearings to azimuths, add station angles, traverse, closure, area, azimuths to bearings. $19.95 pp. Manual only $2 (refund w/order). **P. Billings, Jr.,** 12134 Bonnie Terr., Dept. CS, Seminole, FL 33542. 12-64

SURVEY T/S1000 boundary program $19.95, Send $1.00 for description. **P. Billings, Jr.,** 12134 Bonnie Terr. Dept. CT, Seminole, FL 335424-68

"SYNC-ABSTRACTS" Feature articles plus abstracts of all Sinclair articles published: $12/yr. Nonprofit library service; loan any TS software; $3 (1000-1500); $4.50 (2068/Spectrum) 1 month; catalog $1. **SAFUG,** Box 313, Mason, MI 48854. 1-66

TIMEX 2068- Unlock power of 2050 Modem/Smart 2 telecommunications. Macros, Xlate tables, UL/DL; with detailed examples covered in 35 pages. $7. **Barry Carter,** POB 614, Warren, MI 48090. 5-65

TIMEX/Sinclair 2068 ROM cartridge and cassette software, in original, sealed packaging. Many titles, discount prices! Also custom TS1000/2068 hardware and software for professional, music and special applications. Send $1.00 for catalog. **Montreal T/S User Cat.,** P.O. Box 966, Station B, Montreal, Que. Canada, H3B 3K5.

TIMEX TS-1000 w/16K RAM and Memotech full-stroke keyboard plus software, $125. Send S.A.S.E. for giant list of TS-1000/1500 and Radio Shack/Sharp Pocket Computer books, software and hardware. **Zwillenberg,** 21 Tekening, Dept. CS, Hamilton, NJ 08690.

TS-2068 Programs: VIEWord for word processing and MAIL list for mailing labels. Both programs for $25 total. Additional $10 for FOR-Mail to print individualized form letters. Use AERCO interface and 80-column printer or TS-2040 printer. Order from **Jim Clatfelter,** PO Box 480, Somerset, CA 95684. SASE for details. 4-65

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TS-HORIZONS Magazine for all Timex Sinclair users. Well known writers. Updated information. 32 pages, monthly $15 year. $2 sample. **TSH,** 2002-W Summit, Portsmouth, Ohio 45662. 4-65

T/S SOFTWARE: Twenty 2068, 12 1000 cassette programs, $8 each. SASE brings catalog; SASE and $1.50 brings list of 100 T/S software and hardware delaers. **Jack Deuber,** P.O. Box 305, Casselberry, FL 32707.

ZX81/TS1000 BUILD YOUR OWN 64K RAM pack 8-12K and 12-16K blocks are switchable in/out. Only (14) IC's required - includes (2) double-sided plated through PCBs with schematic and assembly drawings. Fits small Hammond case. Send $20 to **MRP Technology,** P.O. Box 340128, Tampa, FL 33694. 813-961-2595 (7-10 PM) 5-64

ZX81/TS1000 Closeout of 16K monthly software club. Receive any of the following cassettes with documentation for only $4.50. All five for $17.50. #2: Sink the Bismark, Star Trek, Jaws, Cave Adventure, Inventory. #3: Addition Tutor, Bowling Trip Planner, Lunar Lander, Acey-Ducey. #4: Slot Machine, Russian Roulette, Pattern Printer, Harrambi, Cost Comparison. #5: Door Shoot, Craps, Galaxian, Music, Reverse Hangman. #6: Big Six, Guess the down number before the computer, Maze, Life Expectancy. **ZX81 Club,** P.O. Box 22446, Baltimore, MD 21203. 5-65

(126) MISCELLANEOUS MICROCOMPUTERS

APRIL 27 & 28, 1985
COMPUTER SELL-A-RAMA, 68 Shadybrook Armory, Cincinnati, Ohio. I-75 Exit 10B. Held jointly with Ohio Camera Swap. 8ft Tables $25/day; $40 2 days, Admission $2.50. **Bill Bond,** 8910 Cherry, Blue Ash, Ohio 45242, 513-891-5266.

BBII 64K Z80A with two Shugart 8" disks large Sperry keyboard and 15" monitor 1.2 meg storage $800. **John Wytsma,** 9 Pitch Pine, Topsham, ME 04086.

COLECO ADAM, Complete. With extras. Like New. $325. Ray Wegley, 1107 Tener Street, Johnstown, PA 15904. **814-266-4783.**

COLECO ADAM $250. **Jeff, 216-729-2858.**

CP/M 2.2 computer, Z-80A, 64K memory, 12" amber composit monitor, (1) 320K double sided/double density half-height disk drive with word processing, spread sheet, cp/m utilities. (list $1,495) Mint, still in original boxes. $398. Bob **516-921-1465.**

Convergent Workslate, ultra lite, spread sheet, auto dial/answer modem, phone list, calendar, memo pad, 6 extra micro cassette tapes, color printer, case, programs for loan analysis, estate planning, travel log, portfolio analysis, extra NICAD rechargeable battery, etc. $1800 new - $850 nearly new, **Mike 305/921-8115.** 4-64

DURANGO F-85 24 Meg hard Disk, 8 bit with integral dot matrix printer and Two SSQD Drives. dBase II + Acct. Pkg. $900. FOB NYC **LEN 212-777-4353**

EAGLE 3 CP/M computer reburbished by Eagle dealer with **NEW** 800K drives and motherboard. Software includes Wordstar, Proofreader, Grammatik, DB plus, Crosstalk, Spellbinder, Milestone, Smartkey and Accounting Plus Big 8 package. C-Itoh F-10 daisywheel printer, Modem 7 and other PD software. $2500.00. **AWM,** 2979 Sylvan Road, East Point, GA. 30344. 404-766-2628. SASE for specs.5-65

FORTUNE 16:32, 512K RAM, 1D/D, 1-20Meg hard-disk, green screen, no documents/software, hard-disk needs repair. Sold As Is: $2500 negotiable. Dan, **713-988-2002** X498; 713-933-9399.

I BUY, Sell, & Trade Microcomputers. Special!!!! Zorba with 16 bit MS-DOS 2.11 Board - $1200. 90 day warranty. **Godfather's Used Computer Syndicate,** P.O. Box 3037, 1154 W. SR 436, Forest City, FL 32714 305-774-1111

I Buy, Sell & Trade Microcomputers. Special!!! Vector 3 With 5 Meg Hard Drive and Qume Sprint 5 printer for only $1200. Zorba with 15 Bit MS-DOS 2.11 Board - $1200. **Godfather's Used Computer Syndicate,** P.O. Box 3037, 1154 W. SR 436, Forest City, FL 32714, (305)774-1111 4-65

KAYPRO 2X computer with or without printer. All original software included, full factory warranty. **CompAg,** 115 Elm, Marion, KS 66861. 316-382-2238. 4-64

KAYPRO IV with all documentation and bundled software - like new 30 day guarantee - $950 VISA or MC accepted. AMT Corp., **617-263-3030 am or pm.**

Kaypro-4 Plus 88 Comuter. Complete original software plus SWP, 8088, 256K, MSDOS adapter card and software-$2000. Call **702-362-5006.**

MOLECULAR 10-8 Meg Hard Disk, CP/M, N-Star, Expandable to 8 Users, w. Software. $1800. **LEN 212-777-4353**

MOLECULAR 10-8 10 Meg Hard Disk, CP/M, N-Star, Expandable to 8 Users, w. Software. $1800. **LEN 212-777-4353.**

MOLECULAR 6032X
30 USER CPM/MPM
NETWORK $8985!

Molecular 6032X CPM/MPM Computer with 60 meg hard disk, 19 CPU user cards, and 30 day guarantee $8985. Terminals available. **Business Computer Exchange,** 202-337-1303/337-8733.

MOTOLA EXORMAC 5 board set. includes M68KVM01a(monoboard microcomputer 32kof RAM 68000). M68KVM11-2 (512k RAM module). M68KVM21 (Intelligent Universal Disk Controller for floppy and hard). M68KVM30 (Multichannel (4) Communication and printer). M68KVM60 (Universal Intelligent Periferal Control). Just add backplain and debug and you have the most powerful Unix System available. (all parts are available from Motorola). Cost to buy from Motorola $13000 + . 4 sets available at $1900 per set or $1200 per board. Gene **914-337-7230.**

Otrona Attache Computer 8 Bit 64K $1500. **408-446-3116.**

SAGE II 68000 based micro. Has 256K RAM (expandable), two DSDD 80-track 640K drives, p-System, word processor, spreadsheet. TOM **702-359-5451** or 359-6667.

SD SYSTEMS Z80 SBC w/manual, assembler in rom, 2K ram $165 obo. 16 - 4118 statics $5 ea. or all for $50. **405-341-7437.** 2-64

SPECTRAVIDEO Software Wanted For SV-328II: Basic Reference Manual: SV601 Six Slot Expansion Box: SV603 Game Adapter: SV607

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Add on for above, each	$230
Disk Controller cards, each	$125
Shugart SA850 8 inch drive	$125
ROM Pack Basic w/Manual, each	$30
Word Processor Pack	$49
Xerox 820 CPU Board, fully populated	$125

Call Anytime **(201) 267-6800** days
References Available **(201) 326-9896** nites

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Morristown Airport, Morristown, NJ 07960

64K RAM Cartridge: **503-343-5693.**

Televideo 802 8-Bit CPM with 2 floppy drives, complete system with software $800. **Steve Gilliland,** 316-442-0500, Box 1107, Arkansas City, KS 67005.

Televideo 816/23 computer 16 users, 23 MBYTHD, 17 MBYT tape, CPM and MMMOST, Call **Charlie** (305)491-1850 4-64

Toshiba T-100 $675!

Toshiba T-100 with disk drive and new, Gorilla monitor. $675. **202-337-1303.**

VECTOR GRAPHIC VSX-3000 MS-DOS/CPM/86 computer. features an 8086 and Z80B, serial & parallel ports, color board. Refurbished by Vector dealer with **NEW** floppy & 10 meg. New $6300.00, sell $2500.00. **AWM,** 2979 Sylvan Road, East Point, GA. 30344 404-766-2628. SASE for specs. 5-65

VICTOR 9000 Microcomputer, 256K Ram, 2 Double-sided drives (2.4 MB), Palmrest keyboard. **CompAg,** 115 Elm, Marion, KS 66861. 316-382-2238. 4-64

VINTAGE COMPUTERS WANTED: Scelbi, Apple I, Similar. Also Cromemco Dazzler. Early Magazines. Software (disk, cassette or paper tape). What have you got? **(312)** 947-9862, Jack Rubin, Box 8234, Chicago, IL 60680 3-64

* * *

WANTED OLIVETTI PV #M18 DT/HD; APRICOT PC Englishmade w/2 disks and hard drive; KAYPRO #4, or 16 or 10. Must be reasonably priced - can be used. Remember no skill required to pay full-retail, any dummy can do that. John Hedde, Box 660, Wyandotte, MI 48192. **313-281-2424.**

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XENIX SYSTEM 20 MEGABYTES 5 USERS NOW AVAILABLE! $2750!

ALTOS 8600-12 5 User system with 20 meg hard disk, 512k, 8 inch floppy. Demos in boxes with 30 day guarantee-$2750. 20 meg add-on drive-$1649. MTU-3 tape back-up unit-$1400. XENIX Run Time and Development System-$500. Quantity discounts available. **Business Computer Exchange,** 202-337-1303.

(127) XEROX COMPUTERS FOR SALE

Maintenance Manual for Xerox 820, 820-II. Includes technical reference, parts list and schematics. $25. Send certified check or money order. Bruce Hassell, 2973 Grant Rd., Columbus, GA 31907 **404-563-4196.5-65**

XEROX 820-I, 5¼" Drives, CP/M, Wordstar, Supercalc, Like New $600. **LEN 212-777-4353.**

XEROX 820-I UPGRADE to double-sided, double-density drives from SWP. Both 8" and 5¼" models available, mint (list $200) $140. (With tested 820-I board add $69.) B/W high res. Motorola 12" non-composit monitor for 820-I with power supply and connectors, new surplus $50. Bob **516-921-1465.**

Xerox 820 Model II
& Floppy Adapter

New mother boards and adapters $319.00 plus shipping **612-636-5103.** 5-65

Xerox 860, Word Processor, PP Screen, 45 CPS Printer, 4 yrs. old. $5000, Knoxville, TN **615-573-5303.**

(127A) XEROX COMPUTERS WANTED

(127B) XEROX SOFTWARE, PERIPHERAL

—BIG BOARD BUILDERS—

KEYBOARDS $35 - See "APPLE BUILDER KEYBOARD" ad in category 108 for a super, full ASCII, 83 key keyboard which also works great with the Big Board/820 series computers. Thanks, **Electrovalue Industrial.** 12-70

(128) MISC. MICRO, SOFTWARE, PERIPH.

5 Megabyte Hard Disk Drives, unused $150. Will interface to most computers: 6809, Z80, STD, S-100, Flex, CP/M, Apple, Heath. Call DIGITAL SEARCH **803-877-9444.**

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COLOR MONITOR by IBM for IMB-PC. Hardly Used. Cost $680. Sell for $399. **Syd Spain,** 1404 Sebesta, College Station, TX 77840.

I HAVE Like new, warranted double sided, 80 track, 96 TPI, half-height TEAC 55F 5' drives with 811K storage for your IBM PC's, Sanyo's Radio Shack's, or many other systems for $125 each, delivered. **Godfather's Used Computer Syndicate,** P.O. Box 3037, 1154 W. SR 436, Forest City, FL 32714 305-774-1111

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PUBLIC DOMAIN 5" $5SS/ $6DS/ $8FL, Librarys: S/GM & CP/M, IBM PC, Osborne, Zurba, CPM 86. 40 + FRMTS. SASE, VISA /MC. **Cramer,** BX28606CS, Columbus, Ohio 43228-0606 3-63

SANYO SOFTWARE: for sale/trade. Relocatable RAMdrive (128K up). Pacman, Killbell, more. For 55X. **C. Liao,** 61 Overbrook Dr., Princeton, NJ 08540. 2-65

X-RATED PARTY disks. Adult jokes for PCs. Specify Sanyo, IBM, Apple, or TRS Model-4. Send $19.95 to: **Computers,** P.O. Box 1358, Middlesboro, KY 40965 4-65

dBASE II/III Letterhead logo graphics strategies w/most dot matrix printers. Single/Multipage report headers. Sourcecode Documentation, $7. **Harvey Gardner,** PO Box 340, Huntington, NY 11743 4-66

(129) S-100 COMPUTERS

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10 SLOT S100 boxes with power supply (surplus). Also available with front panel openings for 5¼" FD/HD drives. SASE. **Suntec Computers,** 1523 Eubank NE, Albuquerque, NM 87112, 505-298-0800. 5-65

8" NORTHSTAR System Dual DS/DD Drives Morrow DJ2D CP/M. Hazeltime Terminal **513-878-7595** Before 9 PM. $2200, Amber Monitor $70. 4-65

IMSAI 8080- 22 slot motherboard with active termination 6-8k static ram boards Imsai PIO & MIO boards. SOROC IQ120 terminal. 2 - Icom 3712 8" SS-SD drives & controller. Software: CP/M lookalike, wordprocessor, C-Basic compiler, G.L. & P.R. by Serendipity. Documentation & extra disks. $1000 takes the lot. **Dave Chase,** Box 56, Ossipee, NH 03864 603-539-4032.

COMPLETE CP/M 2.2 SYSTEM 12 slot C.C.S. mainframe with Z80A CPU, 64 DRAM, FDC, & 2P/2S IO Boards. 2-8" shugart 850 Drives w/power supply. SOROC IQ-135 terminal w/amber display. Gemini 15 printer with serial interface. D-Cat 300 BAUD Modem. Approximately 75 SS/DD disks. Documentation and software including: MBASIC; CBASIC; Microsoft COBOL; Turbo Pascal; dBase II; Nevada COBOL, FORTRAN, EDIT; Perfect writer, filer, speller. Over $4,000 invested, $1900 delivered. **Frank Days,** re Vision Inc., 103 W. Main St., #13, Niantic, CT 06357, 203-739-4670 (evenings).

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COMPUPRO 816 with MPM systems support board interfacer 4 8085/8088 dual processor board with 384U Compupro static RAM dual Qume DSDD drives, Televideo 825 terminal. Good working condition. **Rod Moore,** 906 Comanche Court, Camarillo, CA 93010.

COMPUPRO DISK 2 Controller Boards CSC $300 a set, (1) 20 Meg Fujitsu 8" Hard Drive under warranty $1600, (1) 10 Meg Hard Drive need work $200, (1) clock bd $50, (2) Marrow Hard Drive controller BDS $100. Call **309-764-4344,** Ext. 219 ask for Greg. 3-64

COMPUPRO Z-80 computer system. Includes CPU, 64K CMOS RAM, DISK-1 FDC, 2 Parallel, 2 serial I/O, 8" DSDD floppy and 5 MB Winchester. Also contains Hayes Micromodem-100 auto-dial/answer modem. All original disks and documentation. Buy entire system and receive $1000 in software included. (CPM 2.2, UCSD P-system, MITE communication package, Z80 MASM/LINK, NEVADA FORTRAN, EDIT, PASCAL, Microsoft MULTIPLAN) Unbelievable at $3800. Add terminal and printer for complete system. (over $6000 new). Also, Cromemco 4FDC $100, 32K RAM $50, Centronics 306 printer $100, INFOTON Vistar terminal $100, dual 8" floppy disk cabinet s/PS $75, 2- 8" DSDD drives (SHUGART, needs head alignment) $100/pair. Contact A. Lassiter 6 pm MST **505-266-6526.** 5-65

CROMEMCO COMPUTER Boards at appx. 75% off list prices. Call for quotes. We have in stock 64KZ, 64KZ II, TU-ART, WDI-II, 4FDC, 16FDC, 64FDC, ZPU, ZPUII, PRI, DAZZLER, QUADART, SDIV, 16KZ, DPU, MCU, MSU512, MCU, VPU, STDC, CNI, GPIB, 48KTP, SCC. CEC **415-342-4058,** P.O. Box 1965, Burlingame, Calif. 94010.

CROMEMCO COMPUTER Boards at apprx. 75% off list prices. Call for quotes. We have in stock 65KZ, 64KZ II, TU-ART, WDI-II, 4FDC, 16FDC, 64FDC, ZPU, ZPUII, PRI, Dazzler, Quadart, SDIV, 16KZ, DPU, MCU, MSU512, MC4, VPU, STDC, CNI, GPIB, 48KTP, SCC. CEC **415-432-4058,** P.O. Box 1965, Burlingame, Calif. 94010.

CROMEMCO Z2H, 11 meg hard dis, 128k, Cromix, line printer, letter printer, 3100 terminal, best offer. **Joe 405-733-1683** 4-65

CROMEMCO Z-2H- System Two with 11MB hard disk and two 5¼" DSDD drives. ZPU, 16FDC with 3.08 ROM (boots from HD), 128K, PRI, and WDI; Cromemco hardware and Op. Sys. manuals; C/PM 2.2, latest CDOS 2.58, and latest CROMIX

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Classified listing of services, publications, consultants and business opportunities. Listing by subject. Vendor classification not available. Standard classified rates and policies apply.

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Is your computer collecting dust? Why not put it to use! I have some excellent proven ideas for making money and starting a business at home! Send $5 to **P. Henderson,** 55 South Governors Avenue, Dover, Delaware 19901. 5-65

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CompuPro RAM 21 $495.00, Disk 1 $225.00, System Support 1, $250.00, Interfacer 3, $295.00 8085/8088 CPU $195, 6mHz 280 CPU $150, RAM 22 $995, M Drive H $695.00 CompuPro Box with 22 slot, motherboard $395.00, Phone **415-651-5931 4-64**

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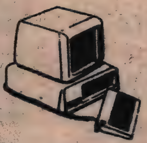

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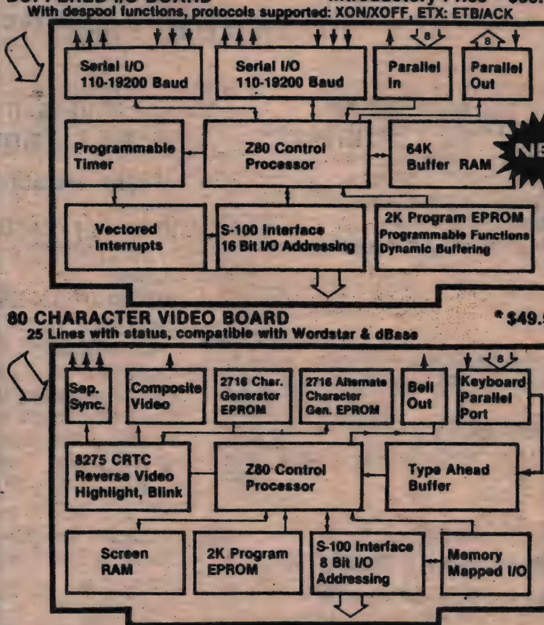
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MPI MOD 51S SSDD Unused Drives in factory boxes, $88.00, **CEC,** (415)342-4058, P.O. Box 1965, Burlingame, Calif. 94010 4-64

Model H-8, 48k, 1 disk, H-19 terminal, cp/m, magic wand wp, basic compiler. Runs good. $650 or best offer. Want parts? Send offers to **Ned Epstein,** 7275 Greenway, St. Louis, MO 63130. 314-727-9916.

WANTED: Digital Pathways TCU-50 Clock Card For Q BUS, Ed**412-854-1133.**

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(132A) HEATH, SOFTWARE, PERIPHERAL

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(133) BURROUGHS SYSTEMS

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HP-86B COMPUTER 128K printer 82906A Dual Disc 9121 Monitor AP-ROM Vicicalc Word/80 File/80, $2500, **(318)984-5508,** Billy Ramagost, 209 Aundria Dr., Layfayette, LA 70503 3-64

* * *

HP-75C with Math, Visicalc, Communications and I/O Roms and FORTH tape plus all manuals $800 or B/O. **J.J. Thompson,** 281 Warren Ave., Kenmore, N.Y. 14217 3-64

(134A) HEWLETT PACKARD COMPUTERS WANTED

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(134B) HEWLETT PACKARD SOFTWARE, PERIPH.

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HP 75 prepares 1984 tax returns! TAXCOMP calculates federal income tax, given taxable income and filing status (also handles state tax). INCAVER automates Schedule G and "calls" TAXCOMP. Uses arrow keys to scroll display by line number on Schedule G. Saves inputs for "what if" analysis. Both programs produced by professional tax preparer and used commercially. TAXCOMP $12 for 2 nonprivate cards + documentation. Both programs $20 for 4 cards + documentation. HP-WARE **718-442-7109** 77 Labau Ave., Staten Island, NY 10301.

HP THINKJET Printer (2225A) $350. HP Double Disc Drive (9121D) With 20 + Discs $650 (9 months of light use). Call **517-783-4255.** Postpaid. 4-65

(136) DATA GENERAL SYSTEMS

(138) DATA GENERAL, SOFTWARE PERIPH.

(142) DATAPOINT SYSTEMS

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(148) DEC SYSTEMS FOR SALE

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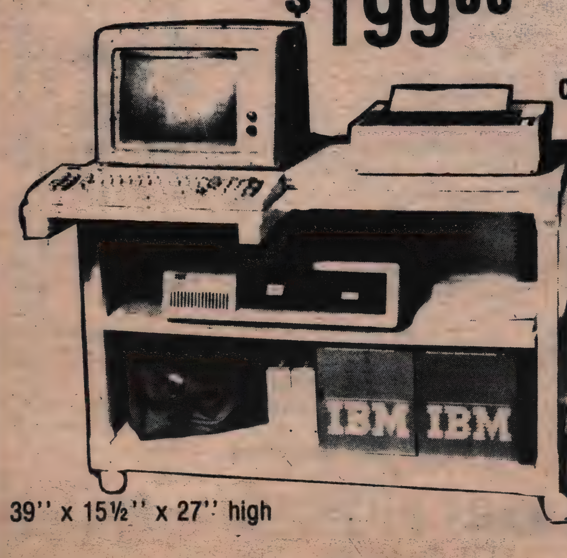

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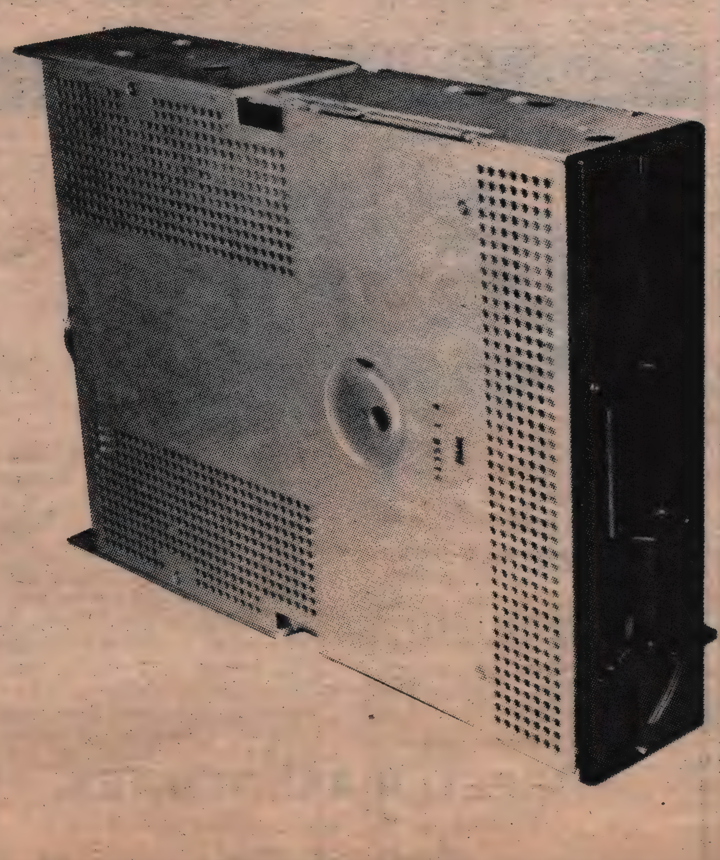

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* * *

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(174) PRINTERS

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DIABLO 1620 printer/typewriter with track or drive - has been upgraded to handle 300, 1200 or 4800 baud and ETX/ACK or DC1/DC3 protocols. Extra ribbons and all manuals. Asking $565. Call **Tom,** 219-769-3671. 5-65

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WANTED: OLYMPIA #ESW 102; Olympia Electronic Compact RO Letter Quality bidirectional; Olympia ESW 3000, or OLIVETTI-OPE DY 450. Must be reasonably priced. John Hedde, Box 660, Wyandotte, MI 48192-0660. **313-281-2424.**

WANTED Printronix 300 or 600 LPM Printer Must be RS-232 **1-800-433-4014, 1-817-595-2166** 4-65

Zenith Z-125 Dot Matrix printer. 9x9 Matrix, Excess of 150 CPS, 10, 12, 13.2, 16.5 Characters Per Inch. Full 95 Character ACSII Font Plus Block Graphics. 256 Character Buffer. $495 **Cascade Electronics,** Route 1 Box 8, Randolph, MN 55065 507-645-7997.

(176) PUNCHED CARD EQUIPMENT

NORTHSTAR HORIZON 64K two drives, hazeltine 1500, Software $2000, B/O **David** 617-497-1268 must sell 3-65

(178) TAPE DRIVES

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½" mag tape drives. New and used. Wanco 7" & 10" from $150 to $400 ea. DIGITAL SEARCH **803-877-9444.**

(180) CRT'S

CRT: Soroc 120, $250, **Mike 305/921-8115** 4-64

HI-RES 12 INCH MONITORS

Black & white, 20 MHz video bandwidth. OEM excess, never used, no case, separate sync, 117 VAC. Supplied with matching power and interface connectors, full manual & Apple hook-up info. Tested. 30 day guarantee. 21 pounds UPS plus $49. **Electrovalue Industrial,** Box 376-C Morris Plains, NJ 07950. 201-267-1117. 7-66

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WANTED QUADRAM QUADSCREEN #QS-8500 HS-17"; SCION Solid State Master Graphics Display Monitor; QUADRAM CH 84 10 Quadchrome II 14" Color Monitor. Must be reasonably priced. John Hedde, Box 660, Wyandotte, MI 48192. **313-281-2424.**

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WYSE 50's
$350!

WYSE 50 Terminals. Used with 30 day guarantee. **202-337-1303/8733.**

(181) TELE-VIDEO CRT TERMINALS

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TELEVIDEO 970 terminals. Excellent condition. DEC VT-100 compatible. $795 or best offer. Howard **713-682-4759** or 713-280-2375 Houston.

TELEVIDEO 910 $300, Call **615-282-0756** After 6:00 P.M. EST.

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Televideo 950's	**$335**
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(182) TERMINALS

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ADM-20 or Morrow MDT20 Terminal, used with Morrow & others, 12" display, detachable 92-key keyboard, RS-232. $249 plus shipping. **Computer Parts Mart,** 3200 Park Blvd., Palo Alto, CA 94306. 415-493-5930.

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Terminals Viewpoint A2...$300, VT100...$450, WYSE 100...$450, TI Silent 700...$200. **APPLIED COMPUTERS,** 916-685-9209. 5-65

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(188) MISC. EQUIPMENT

AIM 65 with assembler basic forth and power supply plus all manuals. Asking $225, Call **Alan,** 206-328-1639 evenings only 4-68

APRIL 27 & 28, 1985
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(189) BOOKS, MAGAZINES

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CP/M SOFTWARE all 8"SSSD. BDS-C Compiler 1.5a; $110. Microsoft Macro-80(M80) assembler; $100. ZSID debugger; $85. REVAS-3 Z-80 Disassembler; $60. DIS68 interactive CP/M cross disassembler for 6800/6801/6802/6805/6808 code; $75. 2500AD relocatable macro cross assemblers for 8051/8751, 6801/6800, 6805; $70 each. ZCPR2 or ZCPR3 public domain CP/M - CCP replacement (5 disks); $40 ea. $70 both **M. Bickerton,** 47 Birchwood Court, Tinton Falls, NJ 07724 201-842-3762.

CRITICAL PATH Pert Analysis Package $70. CP/M version 2.2 Output can be sorted/displayed nine different ways. Bar chart with automatic scaling provided. Maximum of 200 network activities and 300 external calendar dates. Requires 80 column CRT. User's Guide $5 (refundable with purchase of software). Available in most disk formats. **Stem Software Products,** Box 17684, Tampa, Florida 33682. 5-66

CUSTOM WORDSTAR Patches for your **EPSON** Printer. Get boldface, double strike, underlining, double width, scripting italics, compressed and more for only $9.95. Send check or money order to: **SM Urban,** RD #1, Box 431K, Palmyra, PA 17078. 5-67

CUSTOM WORDSTAR patches for your **Epson** printer. Get boldface, double strike, underlining, double width, scripting, italics, compressed and more for only $9.95. Send check or money order to: **S.M. Urban,** RD #1, Box 431K, Palmyra, PA 17078. 2-64

FILE TRANSFER "XLINK" allows 2-way transfer of **any type** disk file over RS232 up to 4800 baud. Specify disk formats for source and destination computers. Excellent utility for only $29.95 send check or money order to: **S.M. Urban,** RD #1, Box 431K, Palmyra, PA 17078.2-64

FILE TRANSFER "XLINK" allows 2-way transfer of **ANY TYPE** disk file over RS232 up to 4800 Baud. Specify disk formats for source and destination computers. Excellent utility for only $29.95. Send check or money order to: **SM Urban,** RD #1, Box 431K, Palmyra, PA 17078.5-67

FREE SOFTWARE for 5¼" CP/M computers (Osbornes, Keypros, Marrows, etc.) available through the Public Domain Users Group. Hundreds of programs: games (adventure, chess), utilities and specialty (Modem7, database). For information, send SASE to **Public Domain Users Group,** P.O. Box 1442-C9, Orange Park, FL 32067.

FREE SOFTWARE for 5¼" CP/M computers (Osbornes, Kaypros, Marrows, etc.) available through the Public Domain Users Group. Hundreds of programs: games (adventure, chess) utilities and specialty (Modem 7, database). For information send SASE to **Public Domain Users Group,** P.O. Box 1442-C9, Orange Park, FL 32067.

NEEDED A copy of the install command configuring the HZ-89 computer for the software program named Datastar by Micropro. This needs to run on CPM-80 soft sector 5¼ or 8's ss,sd. Call or write **Roger Guilford,** 1511 N. 14th, Frederick, Oklahome 73542 or 405-335-2571 4-64

* * *

PRINTER CONTROL - SOFTWARE

On disk. No more installation of any hardware. PRINSET.COM or MICROPRT.COM allows your mind to make the choice, the disk send the message and your Epson or an Epson compatible printer do the work. Your choice of Menu selection for: Skip perforations, Enhanced mode, Italics, condensed mode (Enhanced or standard) or Double Stroke. Also MICROPRT.COM for all your small printing. Most CP/M formats (Specify) $19.95 **A.O.M. Computer Supplies,** 222 Lighthouse Rd., Piney Point, MD 20674. SASE. Info 4-65

SUPER MAILING LIST PROGRAM for CP/M(tm) 2.2 based microcomputers with 2 disk drives and printer capable of 132 columns for maximum usage. See description in February 1985 issue of Popular Computing. Recently endorsed as a data file standard. Supplied on 8" SSSD, 5.25" Kaypro and most others (please write). Special introductory offer by ABLE DATA(tm) SOFTWARE INC., P.O. Box 86923, Dept. B, North Vancouver, B.C. V7L 4P6 only U.S. $19.95 postpaid check or money order. 5-66

TUTORI/O. Animates, debugs, unleashes bdos functions. "Breathtaking," Dr. Dobb's, Oct 83, p. 112, $31. **Roy Lipscomb,** Logic Associates, 1433 Thome, Chicago, IL 60660. 312-274-0531. 11-64

WordStar 5" CP/M-80, $100., SpellStar $50., **DataStar** 5" + 8" $45. **CalcStar** $35. All Sealed w License. **Len 212-777-4353.**

WordStar 5" CP/M-80, $100., SpellStar $50., **DataStar** 5" + 8" $45. **CalcStar** $35. All Sealed w License. **LEN 212-777-4353.**

(192) MISC. SOFTWARE

APRIL 27 & 28, 1985

COMPUTER SELL-A-RAMA, 69 Shadybrook Armory, Cincinnati, Ohio. I-75 Exit 10B. Held jointly with Ohio Camera Swap. 8ft. tables $25/day; $40 2 days. Admission $2.50. **Bill Bond,** 8910 Cherry, Blue Ash, Ohio 45242, 513-891-5266.

COMPLETE ORIGINAL New Infostar System $160. It will not load on our MPM system. With warranty cards. Len **303-249-0161.** 5-65

KAYPRO ACCOUNTING Software, GL, AR, INV, Interacting or standalone, @ $50. **CompAg,** 115 Elm, Marion, KS 66861. 316-382-2238.4-64

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SAVE $$$- Generate labels or postcards in sorted order by name or zipcode, or in order for bulk-rate preparation. Fully menu driven and very "user friendly." Error checking routines prevent logical errors. Add up to 6 additional fields with custom menu software installation driver. Add, edit, or view records. Use with Mailmerge. Use with dBase II or III ($79). This is the "ultimate mail-management system!" (Requires 2- disk drives or 1-hard disk).

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Perfect for your small business! If you want to "computerize" your business, this is the program for you! Customer list with custom installation of fields. Accounts Receivable, Accounts Payable, Inventory, Reports. Full editing features. Use with dBase II or III ($89). ***Send check, money order, or order COD. Will operate on most CP/M and MS-DOS formats. SASE for info or call **818-789-0173.** SOFTWARE DEVELOPERS, 5305 Buffalo Ave., Van Nuys, CA 91401.

* * *

MONEY! PCjr can manage it, save it, make it for you with **jrWARE Money Management Software.** Ten complete program listings for only $3.95. **jrWARE DISK** for $6.95. Check/money order (CCR)(PP), to **jrWARE;** Dept. 852CS, P.O. Box 31427; Dayton, OH 45431.

* * *

Mathematics Package: set of eight double and one single precision Microsoft Basic programs for the Macintosh covering: Matrix singular value decomposition, eigenvalues and eigenvectors of a real symmetric matrix (20x20), generalized pseudo-inverse of a rectangular matrix (17x17), least squares solution of minimum norn to a system of linear equations (up to 19x19), Fourier analysis of time series and least square power spectrums with equally and unequally spaced data, Fast Fourier Transform (256 points) with phase and amplitude spectrums, generalized nonlinear weighted least squares with options for absolute, relative, and weighted fits (user supplies model with derivatives - Newton Raphson iteration scheme), quick x-y plotting routine. Programs written on a 128K RAM Mac using MS Version 1, but are compatible with MS Version 2 (with reduced dimensions). Results can be plotted to screen with options to print to printer and data file. Input from keyboard or file. Disk also contains generation programs and data files used in examples. Good documentation. Many easy-to-follow examples. Programs can be expanded for Mac with 512K by increasing dimension statements. A valuable package of tools for data analysis. Price: $220. Add $5 shipping. Send check or money order to: **Greer Software Products,** Div. CS, Box 268, Annandale, Virginia 22003. 4-64

NEW AND USED Software for CP/M and TRS-80 systems. Call or write for list (203)753-1798, **Robert Lee,** 25 Amaryllis Ave., Waterbury, CT 06710 3-64

Track the USFL this season! Weekly updates build a database which provides informative statistics on the entire league. Compare teams with point spread routine. Easily converted for NFL, local leagues even other sports. Standard BASIC source listing and documentation only $3.25 ppd. **USFL Update,** 4097 Meadowsweet Dr., Dayton OH 45424.

VICTOR 9000 Accounting Plus Software. GL, SO, AR, PO, AP, INV at $99.00, **CompAg,** 115 Elm, Marion, KS 66861, 316-382-2238 4-64

(193) ARCADE/VIDEO GAMES

DEC 11/40 $895. In Chasis. Hank Rempel, **415-829-4976.**

NEEDED: INTELLIVISION Sea Battle, NFL Football, NBA Basketball, Zaxon, and Frogger cartridge. **C.T. Huth,** 130 Hunter, Tiffin, OH 44883. 1-64

(194) MISC. ACCESSORIES & SUPPLIES

APRIL 27 & 28, 1985

COMPUTER SELL-A-RAMA, 68 Shadybrook Armory, Cincinnati, Ohio. I-75 Exit 10B. Held jointly with Ohio Camera Swap. 8ft. tables $25/day; $40 2 days. Admission $2.50. **Bill Bond,** 8910 Cherry, Blue Ash, Ohio 45242, 513-891-5266.

DISKETTES

BASF 5.25" SS/DD $21/10 $2.25 ea., DS/DD $24/10 $2.50 ea., 8" SS/SD $28/10 $2.90 ea., DS/DD $31/10 $3.25 ea., **IBM** 5.25" SS/SD $24/10 $2.50 ea., SS/DD $25/10 $2.70 ea., DS/DD $31/10 $3.30 ea., 8" SS/SD $26/10 $2.75 ea., DS/SD $33/10 $3.75 ea., DS/DD $34/10 $3.80 ea., **PC** 5.25" SS/DD $19/10, DS/DD $22/10 **SENTINEL TECHNOLOGIES** 5.25" SS/DD $23/10, DS/DD $27/10, Color Coded Disks 5.25" SS/DD $26/10, DS/DD $31/10. Diskette Head Cleaning Kits $12.95/15, $22.95/30. Diskette Storage Systems Too! All Disks 100% Guaranteed! Much More In Stock. Add $3 Shipping, Ask For Free Price List. **Diskettes Unlimited,** P.O. Box 3746, Cranston, RI 02910.

IBM 8" DS DD soft sectored floppy disks. Minimum order - 20 @ $1 each. Call **Jerry,** 713-980-9071.4-65

MS-DOS COMMANDS on sixty 3x5 Roladex(tm) cards. Indexed with command summary and syntax for each command. $15.95 pp. -MBG- Send payment (CCR) to **Brian Lewis,** 6423 Caracara St, Sarasota, FL 34241. 5-66

(195) INTEGRATED CIRCUITS AND COMPONENTS

64K DRAMS INTEL 150ns Tested 9/$25. **Robert Rossi,** 114 Atlee Drive, Rochester, NY 14626.

MICRO WONDERLAND. Thousands of ICs available. COMMODORE MOS TECHNOLOGY CUSTOM CHIPS - see our ads in Commodore Computers for Sale and Memory - this issue sections. SPECIAL: 256K and 64K DRAMs, SRAMs, 2797PL-02: $14.95 each 10 pcs minimum. RETICON NEW ANALOG DELAY LINES. Disk Drives. OUR BEST SELLER - CUSTOM MULTI-INSTRUMENT CMOS MULTIMELODY GENERATOR ICs - $9.95 each, application notes $3, S&H - $2.50. Much, much more. We have what others haven't - unique components & low prices. New Catalog - $2 postpaid. Call what you need - super prices. **K. BOUFAL-CONSULTING SERVICES,** 244 Fitzwater Street, Philadelphia, PA 19147. 215-925-6469.

MISCELLANEOUS IC'S: MC 6801L1 microcomputer with Motorola's LILBUG monitor in ROM for developing programs; $15, 765 Floppy controller; $10, 68B40 counter/timer; $8, 2147 high speed memory; $3.50, AM9517 DMA Controller; $8. TMS2716 (3 voltage) EPROM $2 ea. **M. Bickerton,** 47 Birchwood Court, Tinton Falls, NJ 07724 201-842-3762.

$33 TOUCHTONE DECODERS

Commercial grade 16 digit Telaris/Collins 7640-01. 12 VDC, built-in dial tone reject and high-low filtering, selectable hexadecimal/high-low outputs. 32 pin hybrid IC. Never used, guaranteed. Price includes decoder, crystal, socket, full documentation, UPS. Call/write for brochure. **Electrovalue Industrial,** Box 376-TCS, Morris Plains, NJ 07950. 201-267-1117. 8-65

(196) HELP WANTED

* * *

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SELL IBM-PC As authorized agent. Send resume and background information to **ECSI,** P.O. Box 878, Harrison, NY 10528. 5-69

(198) POSITIONS WANTED

SHUGART SA1002 hard disk unused $95. **SEAGATE** ST506 used $95. 916-726-3291.

(199) OTHER

DATA PROCESSORS - Over 125 names of Florida companies who use data processors. Not an agency. Send check or money order for $10 to **L.F. Cole,** Dept. CS1, Box 8234-A, Orlando, FL 32856. Fla. residents add 5% sales tax. 5-65

EXIDY SORCERER owners, compiling user information. Send name and address on SASE. **Cyberco,** Route One, Box 748, Cropwell, AL 35054. 1-64

MANUFACTURERS—SELL overseas! International marketing experts seeking unique USA made micro hardware/software. For immediate action please call intercommerce company. **415-726-0875.**

Privacy-Confidential mail receiving-forwarding, private address. Free information. **International Mail Service,** P.O. Box 13763, Orlando, Florida 32859. 5-69

(200) NON-COMPUTER

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with CN Tear Gas Burglamist Module! Holds police size cannister. Fits inconspicuously to back of computer w/self adhesive pad. Tear gas fires if computer is lifted or moved. With full instructions. $39.50. Also electronic version fired by DC pulse $59.50. Satisfaction guaranteed. Illegal in NYC, California. Shipped UPS only. Visa/MC. **ROMNEY,** Box 5247, Spartanburg, SC 29304, 803-583-3081. Save this ad. It seldom appears. 3-66

IBM Selectric Typewriter/printer bought for $370. Sell for $160. Manual schematics & element. Call Terry **904-734-4983.**

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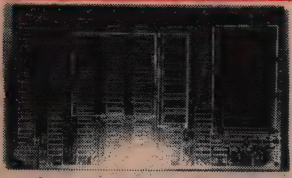
ABS NUMERIC CASE

The great light beige case for the 6502 motherboards that fits our power supply, PCB and keyboard exactly. Also fits others $49.95



6502 MOTHER BOARD

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The famous PARTS GALORE 6502 motherboard that is 100% compatible with upper/lower case. 74LS245 octal buffer (rev-8+), prototype area, and uses EPROMS for all BASIC or boot-to-disc software. (3-2732 or 6-2716 for basic). Still only from us at $29.95

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Our new ASCII keyboard is the best one we have ever had!!! It uses an 8048 5V only microprocessor packed with features like: AUTOREPEAT, UPPER/LOWER CASE, APPLE®, CPM® and BASIC stored macros(88) that allow single stroke entry of many commands like, "CATALOG" "DIR" "RUN" and so on for 88 of them with complete documentation.

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KITS KITS KITS

FOR 6502 BARE PERIPHERAL CARDS

These kits have all the parts needed for the PCB in question but have no IC's. Please get IC's from BG MICRO or JDR MICRODEVICES as they are reputable, low cost and fast. They advertise in the SHOPPER.

16K Solderable parts kit	$13.95
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DISC Solderable parts kit	$11.95
DISC 13/16 Solderable parts kit	$13.95
DISC Rana Solderable parts kit	$24.95
80 Column Solderable parts kit	$16.95
80 Col. SS Solderable parts kit	$18.95
Z-80 Solderable parts kit	$13.95
APPLACARD Solderable parts kit	$39.95
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SPRITE, Manual, software listing and disc	$14.95

NEW EXPANDED 80 COLUMN FOR THE APPLE IIe

This bare PCB allows you to expand your IIe to 128K and get the enhanced 80 column feature in it. It is a real winner and easy to build. We sell it as a bare PCB or wired and tested.

Wired and tested, EXP 80 column board	$99.00
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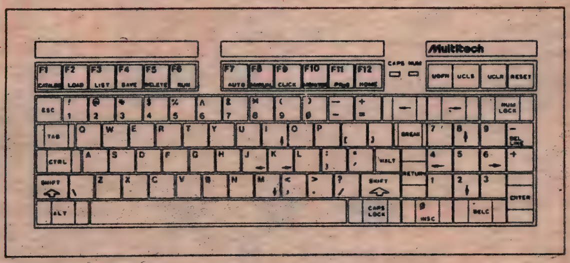
TERMS: Minimum order is $10. For orders less than $60 add $5 shipping & handling for UPS Ground delivery or $10 for UPS 2nd day air. Orders over $60, add 5% for shipping & handling for UPS ground, 10% for 2nd day air. COD orders add $2.50 to above fees. New York residents add proper sales tax. COD payment must be cash, certified check or money order. Phone and mail orders can pay by Visa, MasterCard, Amex. or COD. We accept personal checks with mail orders, but allow two extra weeks for processing.

MAK II ACCUFEEL KEYBOARD



This is a detached keyboard in an ABS case with a 6' curly cord to connect it to 6502 based machines. It uses a serial data format for error free transmissions down the curly cord with a serial to parallel converter board on the end that is fully 6502/Apple compatible. Has auto repeat, beep, no beep, 10 user programmable macros, 50 preprogrammed macros, auto line number, and numeric pad $149.95

APPLE® BARE PC BOARDS PRICE SLASH! NEW LOWER PRICES

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DISC control, 13/16 sector auto select, 2 Dr.	$9.95
DISC control, 4 drive RANA® compatible	$9.95
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MODEM card, SSM® compatible	$14.95
SAM Talking card	$9.95
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TIME card, TIME II® compatible	$9.95
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SPRITE Graphics card, for TI chip	$9.95
PROTOTYPE Large	$15
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All of these bare PCB's come with a parts list and placement diagram. In some cases you will also need software/firmware to operate these cards. This must be composed or found from a users group, we will not supply it.

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The famous APPLE-SEED and APPLE-SEED II are the books that see all, tell all on the various APPLE® clone motherboards and peripherals. They are well worth the $9.95 that we are asking. And KOSMIC has been at it again on IBM® clone motherboards and peripherals and has composed the one and only "BIG BLUE SEED", it goes into greater detail on a smaller number of motherboards and peripherals (over 20 and growing) and will help you to build many of them at a saving.

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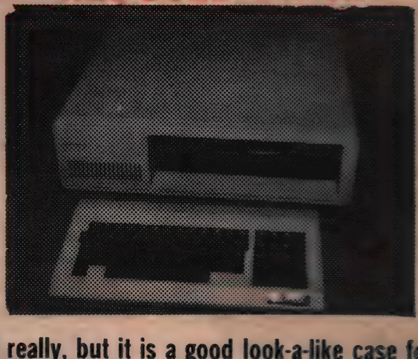

No, not really, but it is a good look-a-like case for IBM PCB builders or 6502 PCB builders. Both PCB's fit inside and the unit has space for a power supply, fan and 2 std or 4 slimline disc drives. NOW ONLY $69.95

HEAVY DUTY POWER SUPPLY $79.95

Our Black Beauty power supply has true specs of 5v at 5 Amp, 12v at 2.5 Amp and −5, −12 at ½ Amp. Each of the +5 or +12 can run at 30% overcurrent for short periods. Has proper sequenced startup and shutdown. Easily runs 2 disc drives and a full set of peripherals.

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4.032 MHZ Xtal (MODEM)	$3.95 ea.
MPSA13 transistor	$.69 ea.
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27 Microhenry coil	$1 ea.
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Inline power jack	$1.29 ea.
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2732 (BLANK)	$9 ea.
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47pf Disc cap	$.20 ea.
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1N914 Diode	$.10 ea.

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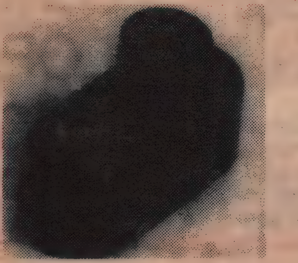

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HEX Keyswitch Pad, oil proof, a nice pad that has X-Y addressing for the 74C922,923 HEX Encoder IC's, easy to interface $4.95

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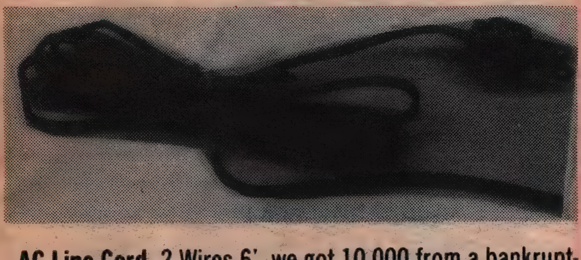

AC Line Cord, 2 Wires 6', we got 10,000 from a bankruptcy and you can get them at a cut rate, only $1.00 for five AC cords.

5 for $1.00

20 PIN right angle header connector for Apple disc controllers etc. A real buy at .... **2 for $1.00**
20 PIN ID female (2x10) for Apple disc drives and also for IBM hard drives. A buy at .... **2 for $1.00**
13 PIN 0.1" right angle gold plated square header pins .... **5 for $1.00**
23 PIN 0.1" straight WW length square header pins .... **3 for $1.00**
AC SOCKET, 3 pin male recessed type that is in use for almost all computers, rectangular shape. A steal at .... **3 for $1.00**
AC SOCKET with line filter by Corcom, good for all computer uses, uses standard rectangular 3 wire cord **$1.50**
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SWITCHING POWER SUPPLY

SMALL SIZE, 75% EFFICIENCY 4" x 7.75"

SPECS: +5VDC — 4 AMPS MAX
+12VDC — 0.8 AMPS MAX
−5VDC — 0.8 AMPS MAX
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INPUT 110/220 VAC 50/60 Hz
75 WATTS MAX INPUT UL#E81169

BRAND NEW UNUSED!

$18.95 EACH — 3 FOR $45.00
3 WIRE AC CORD — $2.00
NOTE: DO NOT CONFUSE THIS UNIT WITH THE LARGER ONE FROM BG MICRO.

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ASCII KEYBOARD

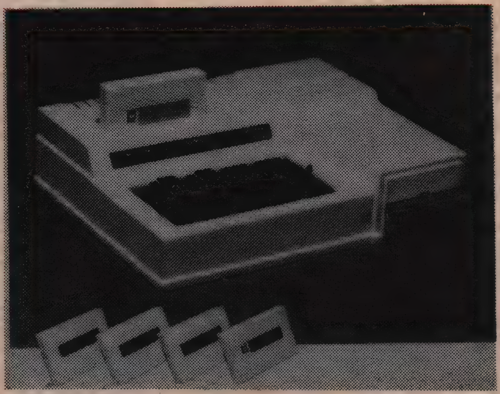
* 8048
* 5V only

* NEW
* Serial
* Parallel
* $19.95

A great deal, this brand new ASCII keyboard came from AES DATA, one of the largest makers of word processors in the world. A novel circuit generates both serial and parallel ASCII out allowing use on both APPLE® and IBM® styles of system. The unit runs on +5V only, has Hall effect keyswitches and uses an 8048 micro for operation. The sculptured keytops are arranged in typewriter style for quick learning and are an attractive light beige in color. We got them for 5% of the $169.00 that AES paid and so we can sell them dirt cheap and still make money. Completely new with 20 pin ribbon IDC connector and pinout for easy interfacing **$19.95**

Vep 46 EPROM PROGRAMMER/ ERASER

$369.00 Specify IBM® or Apple Host Adaptor



The VEP 46 is a totally new concept in EPROM programmers that gives a high degree of freedom to the programmer. Software supplies allows access to the entire memory array of the host computer so that sections of ROM can be examined, moved, edited, and copied to up to 4 EPROMS at one time. Novel BIOS programs can be composed and tested easily and rapidly, the built-in UV lamp allows erasure of up to 10 EPROMS at one time in 20 minutes. Any 5V EPROM, with few exceptions can be programmed. Currently host adaptors are available for the Apple and IBM machines with Commodore to be ready soon. The VEP 46 comes with an extensive manual with step by step instruction showing how to do everything simply and easily. Some features are:

- UL approved power supply
- Compares up to 4 EPROMS to reference EPROM, lists all errors
- Verifies up to 4 blank EPROMS
- IBM® version now ready
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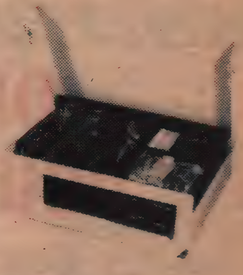

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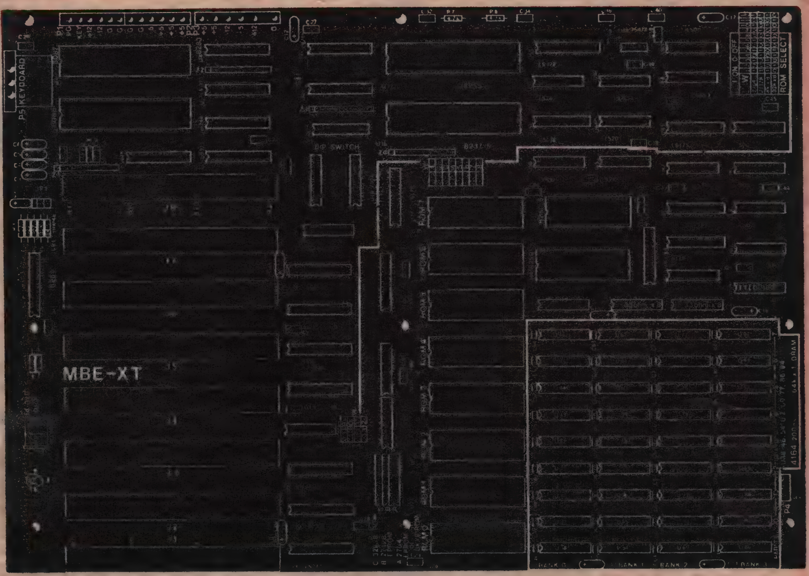

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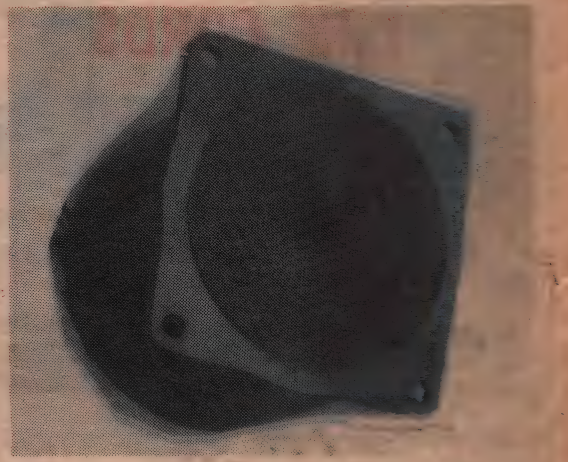

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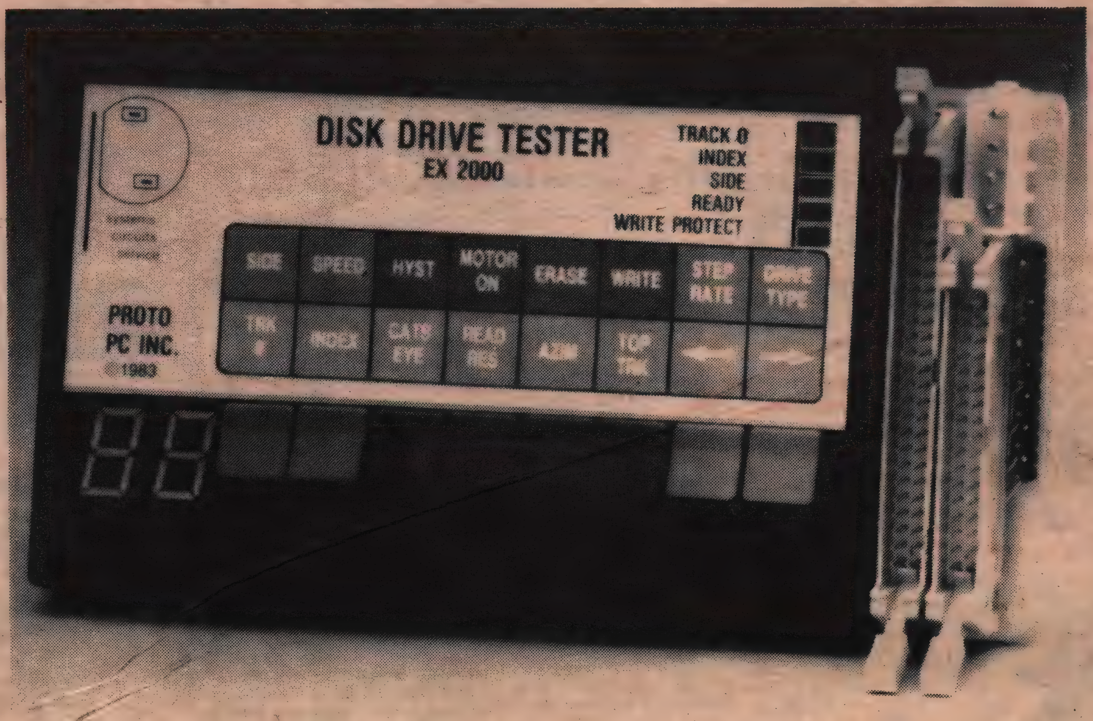
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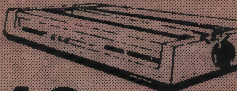

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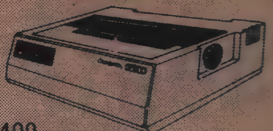

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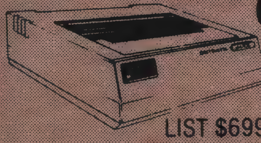

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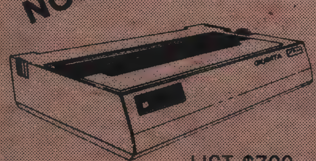

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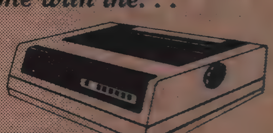

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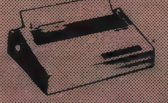

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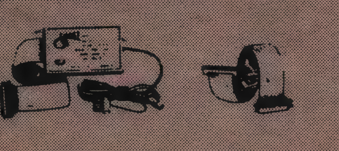

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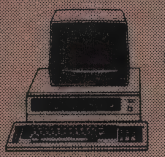

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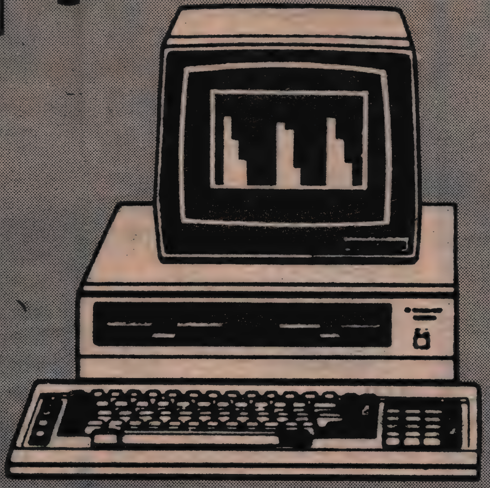

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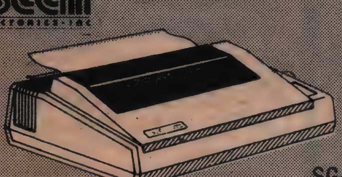

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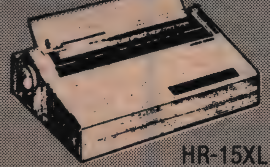

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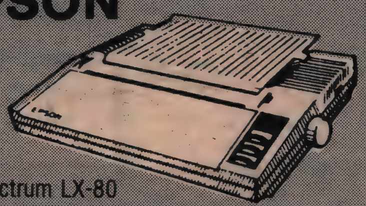

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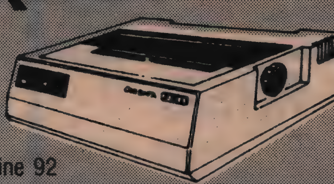

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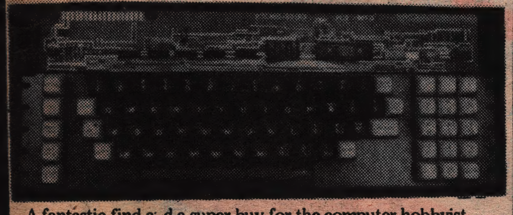

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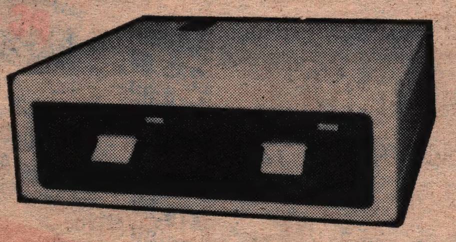

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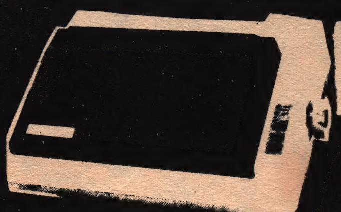

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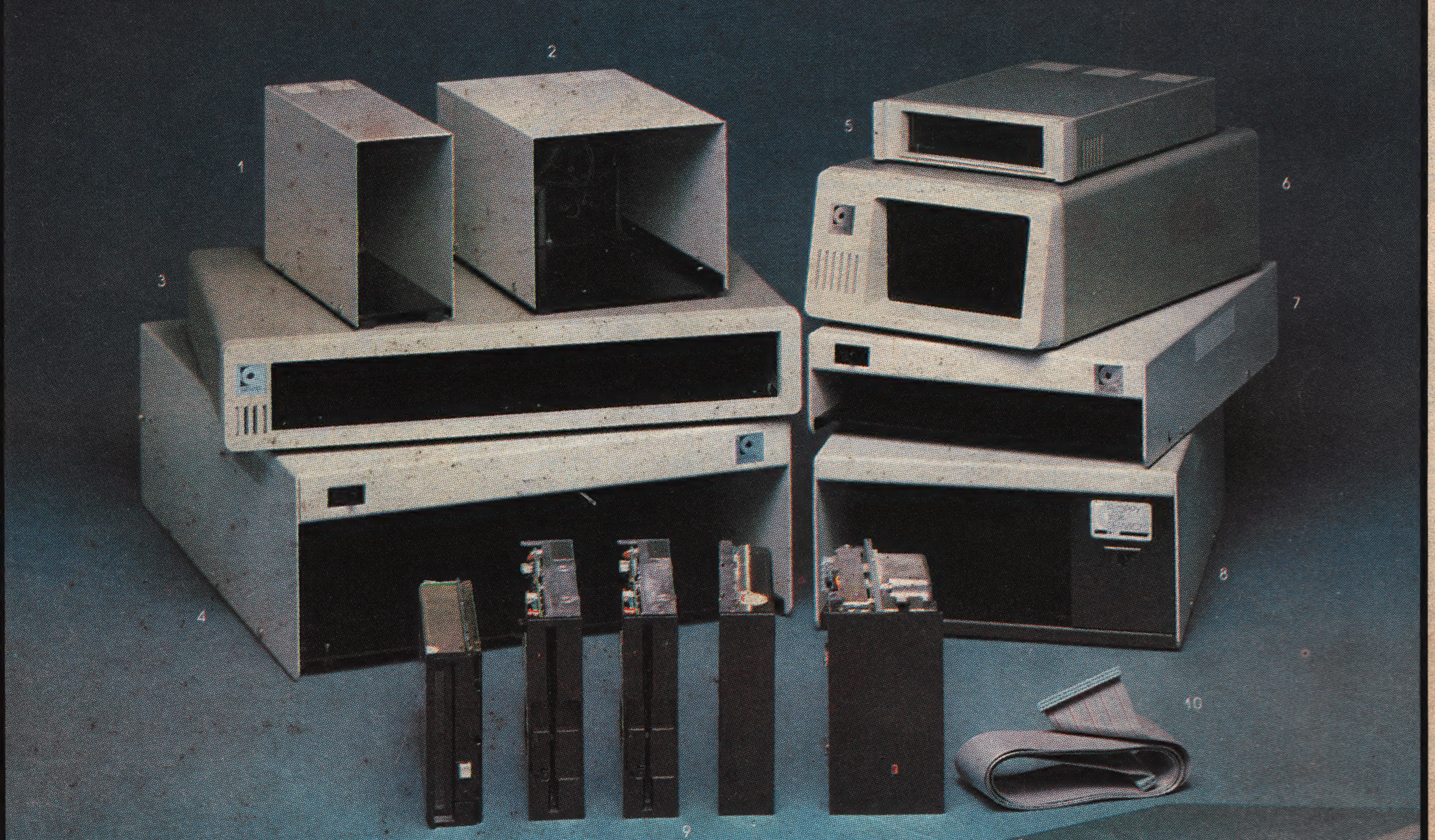

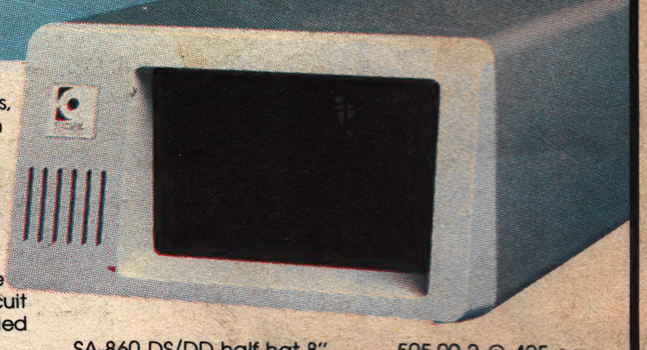

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